Fortune

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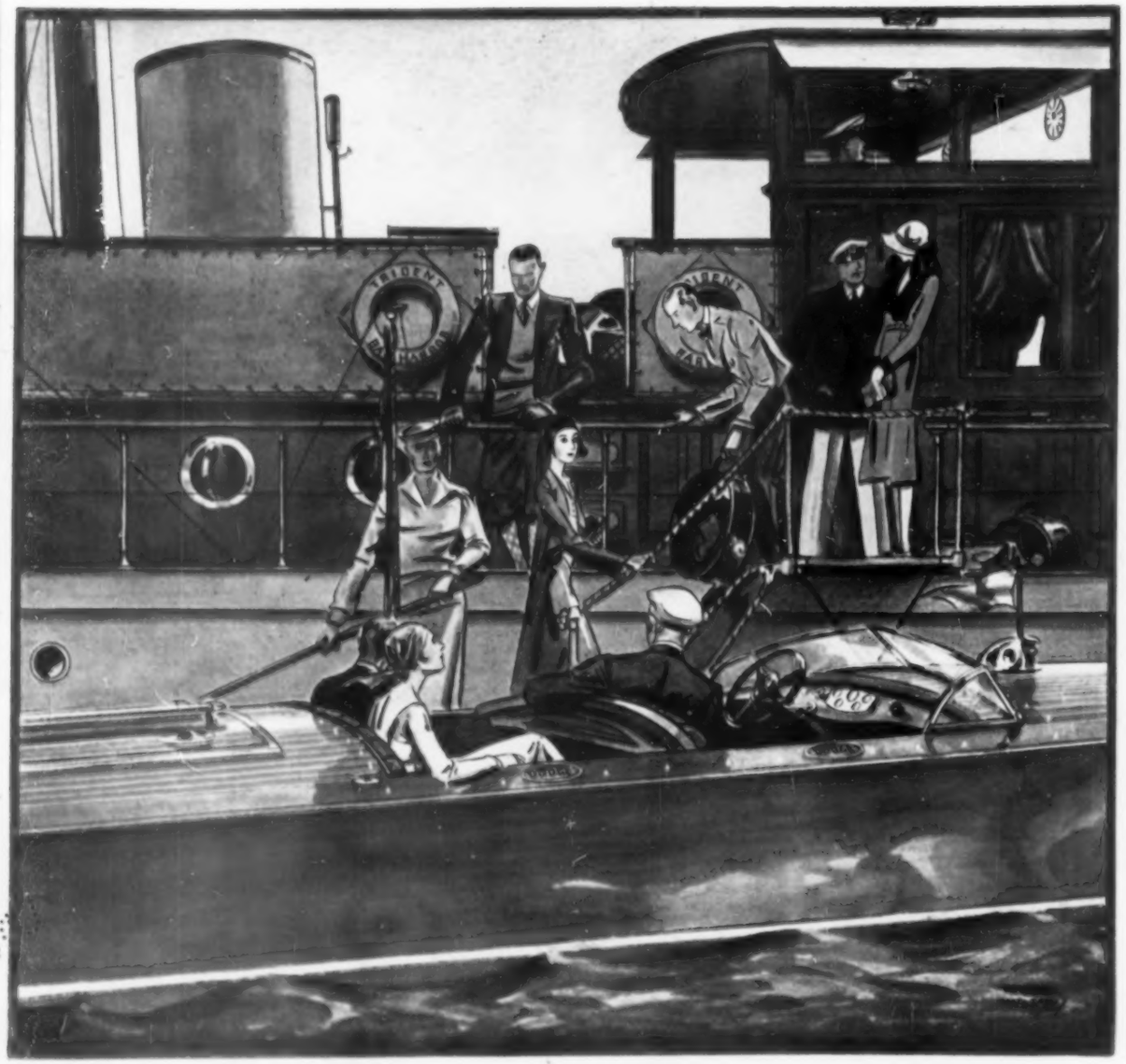


MODEL 3—ILLUSTRATED—25 FT. LONG—SEATS 8—125 H. P., 32 M. P. H.—$2500. OTHER 25-FOOTERS $3200 TO $3900

LIKE all true aristocrats, Dodge Boats are at home in any company . . . . They match quality and beauty with the finest yachts and cruisers . . . . speed and value with the rowdiest outboard on any inland lake . . . . The new Dodge plant, modern from foundation to skylight, is equipped with the newest and most efficient of modern tools . . . . It produces the finest boats that ever bore the name of Dodge . . . . and produces them in quantities so great that they can be priced within the reach of anyone who can afford a motor car . . . . The 16-footer has a speed of 30 miles an hour, and at $945 offers the same inherent quality as the 45-miles-an-hour speedster at $4500 . . . . It is an ideal tender for a larger boat, as is the 21- or even the 25-footer . . . . Each is truly a modern miracle of performance . . . . There's a Dodge dealer near you . . . . See him or write us for the new Dodge catalog

DODGE BOATS

HORACE E. DODGE BOAT & PLANE CORPORATION, Works: Newport News, Virginia. General Sales Department: 21 West 46th Street, New York City

Estate of J. Barstow Smull, Esq., Cold Spring Harbor, Long Island.

It's safer *to insist on Science*

THERE is no compromise with Science. Half-truths and vague sentiment have no place in scientific practice. This is why increasing numbers of those who appreciate the value of their trees are engaging Bartlett.

The Bartlett Way

They pay no more for this precaution. But they do get that extra assurance of seasoned judgment and expert practice sustained by the famous Bartlett Tree Research Laboratories in Stamford. Here nothing is done in a hurry for commercial consideration. Here is assembled the accumulated testimony of centuries of research and experience by pioneers of other generations in the study of tree life, destructive insects and tree diseases.

In the light of all previous knowledge the leading scientists who conduct the Bartlett field laboratories are developing a technic and code of practice which are reflected in practical results in enhanced beauty, increased health and longer life for the trees of those we serve.

For consultation, address Stamford, Connecticut, or the Bartlett branch office nearest you.

The F.A.BARTLETT TREE EXPERT COMPANY

Operating also the Bartlett School of Tree Surgery, and the Bartlett Tree Research Laboratories

STAMFORD, CONNECTICUT

Branch Offices:

Philadelphia White Plains Boston Rochester, N.Y. Westbury, L.I. Orange, N.J.
Syracuse, N. Y. Chicago (*Evanston*) Danbury, Conn. Pittsfield, Mass. Wilmington, Del.

VICK'S NuwuD

BARTLETT Heal Collar

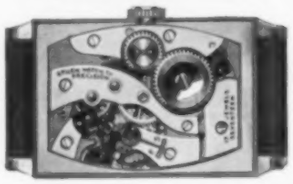
YOU MEN

who want *pocket-watch accuracy* on your wrist

THE OLD WAY

Larger, stronger parts than in any round movement in the same size case. By using all the case space, the Gruen Quadron movement makes possible a new standard of wrist watch accuracy!

THE QUADRON WAY



IT is one thing to make a large pocket watch accurate. But a wrist watch—that calls for unusual skill!

The Gruen Guild has always specialized in small movements. They were first to make an accurate thin pocket watch. They introduced the wrist watch to America. The accuracy they have achieved in small movements is uncanny!

Two hundred Gruen Precision Quadrons—exact duplicates of the Quadrons your Gruen jeweler can show you today—were subjected to official observatory tests in Switzerland.

Every one of the two hundred received the Observatory certificate for timekeeping excellence.

Here is the nearest approach to pocket-watch accuracy ever put on the wrist! Made possible by the common-sense Gruen Quadron principle explained above.

The Gruen jeweler nearest you can show you the Gruen Quadron, as well as many other fine Guild creations, priced $37.50 to $3500. In the larger cities, his name is listed in your Classified Telephone Directory under "Gruen Guild Watches."

Write for a copy of the free booklet "How to Select and Care for a Fine Watch" to Gruen Watch Makers Guild, Time Hill, Cincinnati, U. S. A. Branches in various parts of the world. Largest manufacturers of fine watches exclusively—engaged in the art of fine watch-making for more than half a century.

PRECISION
Trade Mark Reg.

Gruen's golden pledge mark placed only on watches of higher accuracy—none less than $65.

Look for the mark PRECISION *on the dial*

Annapolis—*Gruen's newest Quadron, 17 jewel* PRECISION *movement, 14 kt., coin gold-filled case, with adjustable link band carrying out design of watch, $90.*

Dartmouth—*Another new Gruen Quadron, white gold-filled case with adjustable link band carrying out design of watch. 17 jewel* PRECISION *Quadron movement, $85; with leather strap, $75.*

York—*17 jewel* PRECISION *Quadron movement, 14 kt. solid white or green gold case of modern tailored design, flexible Guild band, $107.50.*

GRUEN QUADRON

Listed in the Classified Telephone Directories of the larger cities under "Gruen Guild Watches" is the name of your nearest Gruen jeweler. His store is marked by this Gruen Service Emblem

Fortune,
October, 1930

FORTUNE is published monthly by TIME, Inc., at 205 East 42nd Street, New York, N. Y. Entered as second class matter January 7, 1930, at the Post Office at New York, N. Y., under the act of March 3, 1879. Subscription rates: One year in the U. S. and possessions, $10; Canada, $10.50; elsewhere, $11.

Vol. 2
No. 4

California Leads America in Population Gain!

Temperature that varies only 6° means all-year outdoor life in the San Francisco Bay region. 59° is the average.

San Francisco leads the West in business opportunity

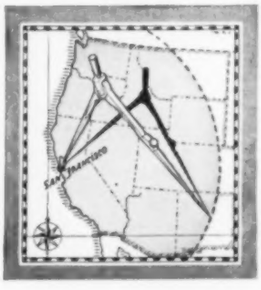
WITH a new population total of 5,672,009 people—a gain over 1920 of 2,245,148 or 65.5 per cent—California shows the greatest population growth in the nation in the last ten years; a growth that was more than four times the nation's average.

Long famous as a state "where life is better," this gain in population was not wholly unexpected. Other factors show the fullness of the development. For instance, in 1920 manufacturing passed agriculture as a source of basic income and the gap between the two has widened ever since. In 1927, the last year for which there are comparable authentic figures, agriculture had a value of $669,325,000, while value added to products by manufacture reached the total of $1,075,400,000.

Increases in property values are a further indication of the sound development:

	Property Value	Property Value Per Capita
1920	$9,110,890,894	$2,658
1929	19,771,806,368	3,486
Increase	117%	31.1%

California offers industry and commerce wealthy, ever growing markets. And San Francisco, in the center of the whole far Western population, offers outstanding opportunity.



Fifty per cent of the total population of the eleven Western states can be served most quickly and cheaply from this city. Another twenty-five per cent can be served on an equal basis with any other city.

Here are headquarters for the leading industrial, commercial, transportation and financial interests of the West.

Here three transcontinental railroads meet the ocean on the edge of a bay where every ship in the world could drop anchor at one time. Highways radiate to all the West.

San Francisco Bay is the traditional gateway to 900,000,000 people who are rapidly developing modern wants in the lands that the Pacific borders. Already San Francisco Bay ranks second only to the port of New York in value of water-borne tonnage.

Manufacturing in the San Francisco Bay area has an annual value of $1,127,926,431—43.5 per cent of the state's total.

San Francisco Bay is the greatest land-locked harbor in the world. Here the vessels of 146 steamship lines call regularly, and tonnage is valued at more than two billion dollars per year.

California Street. San Francisco's banks and finance institutions rate among the nation's first.

With this development has grown a population of 1,600,000 people within one hour's ride of downtown San Francisco. Within the 42 square miles that comprise the city itself, there are today 637,212 people of more than average per capita wealth.

San Francisco offers able men a brilliant opportunity! Here industry and commerce are rising to meet new great demands. Here is a manner of living that brings thousands who come to visit in this all-year outdoorland, back again to live.

Write Californians Inc., Dept. 2210, 703 Market Street, San Francisco, for two illustrated books to tell you more about this city and the potent region that it centers.

SAN FRANCISCO

IN CALIFORNIA—"WHERE LIFE IS BETTER"

"THE COMMON TONGUE"

☆

"Lingua franca" they called it in those days when the English Language was being born of a Norman father and a Saxon mother. It marked the fusing of two alien civilizations—the meeting ground of dissimilar peoples—for mutual understanding.

Today's business world talks a lingua franca of supply and demand, the meeting of human needs by honestly produced supply, and the telling about it in terms of universal humanity.

The wider the experience of the advertising agency, the more able it should be to talk for its clients the common success language of the world.

THE H·K·McCANN COMPANY

ADVERTISING

NEW YORK CHICAGO CLEVELAND DENVER LOS ANGELES SEATTLE SAN FRANCISCO
MONTREAL TORONTO WINNIPEG VANCOUVER LONDON PARIS FRANKFORT o. M.

WORLD'S LARGEST TABLE!

Our Scotch and English craftsmen recently built this enormous table for the directors' room of a great American railroad. More than 30 men can be seated in comfortable armchairs around it and, as far as we know, it is the world's largest table. In fact, it is so much larger than the doorway of the room in which it now stands, that the table had to be built in six separate sections and reassembled inside the directors' room in Philadelphia.

Six different types of understructure were conceived by us and embodied in a special preliminary model, scale 2 inches to the foot, which was submitted by us for the consideration of the architect and the directors.

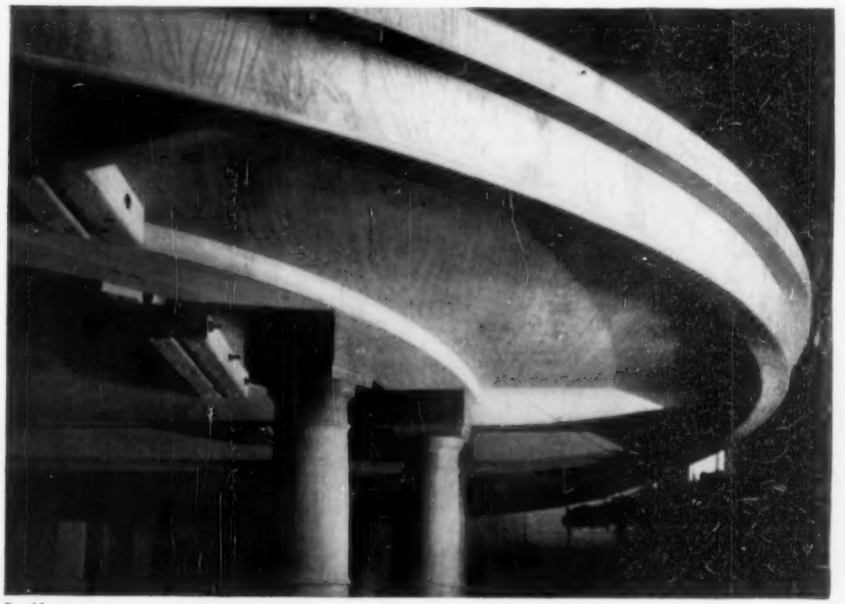
The table top is of choice walnut. The strips of walnut were all taken from the same tree and have been so cunningly matched that the whole huge table top appears to be a single piece of wood.

By ingenious handling of the scale of moldings, it was possible to keep the table top at the most comfortable height from the floor for a seated man (29") and yet have this normal height dimension seem perfectly in proportion with the gigantic dimensions of length and breadth.

The table is trussed and braced with beams of hard maple, 4" x 6", a cross section so unusually large that the beams had to be specially cured to secure complete dryness at the center. The extremely sturdy construction makes it certain that the immense table top will not warp or depart from its present perfect level.

Are you finding it difficult to secure just the right furniture for your own executive offices? We should be glad to have our experts consult with you or your architects and lay out a scheme of appropriate furniture based on your specific needs.

Erskine-Danforth Corporation, designers and makers of choice furniture: New York, 383 Madison Avenue; Chicago, 620 N. Michigan Avenue; Cleveland, 11129 Euclid Avenue; *Distributors:* Boston, 132 Newbury Street; Los Angeles, 2869 West Seventh Street.



Bruehl

• DANERSK •

DANERSK FURNITURE is sold only at the Danersk Showrooms in

NEW YORK, CHICAGO, CLEVELAND, BOSTON, LOS ANGELES

Off the Record

Reindeer Steak and Fried

THERE are ice plants and abattoirs at Elephant Point on Kotzebue Sound. Where can repose the carcasses of 10,000 reindeer. And in Alaska are 1,000,000 reindeer, some herded, some free, running swiftly through the unrelieved snow and by preference against the wind, sniffing each breeze for lichen and in summer for the blueberries which they love.

It was long known in Siberia but only recently in Alaska that these exquisite, nervous animals could not only draw sleds faster and farther than dogs but could also be eaten. The Alaskan discovery of what was commonplace in Siberia followed the importation into the U. S. territory of a small herd of reindeer by Dr. Sheldon Jackson, then Commissioner of Education. The reindeer multiplied, and Alaska became used to having its snow blankets pierced by sharp fleet hooves. Then there were ice plants and abattoirs at Elephant Point on Kotzebue Sound.

And when the reindeer became food he became the subject of distribution and refrigeration, of tariff laws and inspection by bureaus of sanitation, of publicity and competition. But primarily he became steak. More than anyone else it was Mr. Carl J. Lomen who thought of him as steak. Mr. Lomen first came to Alaska because he had heard that there was no place like Nome for gold. He found little gold, but he founded the Lomen Reindeer Corporation. Now you may find him in New York where he has an office, in Washington explaining reindeer to the Committee on Ways and Means, in Alaska during September and October, which is the mating season, on the Pacific coast to see whether people like reindeer steak, in St. Louis to see to it that people when they ask for reindeer steak are not given venison. Unlike venison, reindeer has no gamey taste. Mr. Lomen describes its flavor as something between breast of mallard duck and lamb. There are many ways of serving it. Mr. Lomen knows them all.

It is this knowledge which he is most anxious to impart to the U. S. Because, to Mr. Lomen's constant perplexity, people do not readily think of reindeer when they walk into a restaurant. For one thing the reindeer comes from so far although it should be common knowledge that proper refrigeration in no wise impairs the flavor or quality of meat. (Still many people prefer to eat a chicken that has been killed *in loco* than one which was killed a week ago, iced, and shipped a few thousand miles. The Ice Age cannot be accepted without protest.) And for another thing people do not often ask for unfamiliar foods (and corned beef hash will always be more popular than snails *Bourguignonne*).

Reindeer, however, is not so expensive as to be only the dish of an epicure. Its price is approximately that of venison and, as Mr. Lomen would point out, if more people would *only* eat it the price would fall. Mr. Lomen does everything he can. He persuaded New York's Mayor James J. Walker to proclaim a reindeer week. He wrote to

Underwood & Underwood
CARL J. LOMEN

Oscar of the Waldorf and received an answer praising the meat. He wrote to Alfred W. McCann and received an answer saying the meat was free from diseases and invigorating. He distributes pamphlets to restaurants and hotels and gives interviews whenever he can think of one.

His efforts have not been altogether in vain. In New York the Central Park Casino serves reindeer chops, steaks, and ragouts, but reports little demand for them. New York's Princeton Club and Players Club say their members like it. The Grosvenor Hotel and the St. Regis serve it, but Sherry's and the Marguery have thus far eschewed it. Occasionally Childs has served it, and this might be important, but the patrons of the restaurant rarely ask for it.

If Mr. Lomen's favorite meat is ever to be popular, it will become so slowly. It cannot find an instant (if not prolonged) popularity as did, for instance, Eskimo Pies. It is not as cheap as grapefruit and by its very nature cannot be easily accepted into familiarity. Yet there seems no reason why many a tavern and many a chop house should not some day ring with orders for "reindeer steak and fried." And Mr. Lomen, very happy indeed, would add: "And a little apple sauce, please."

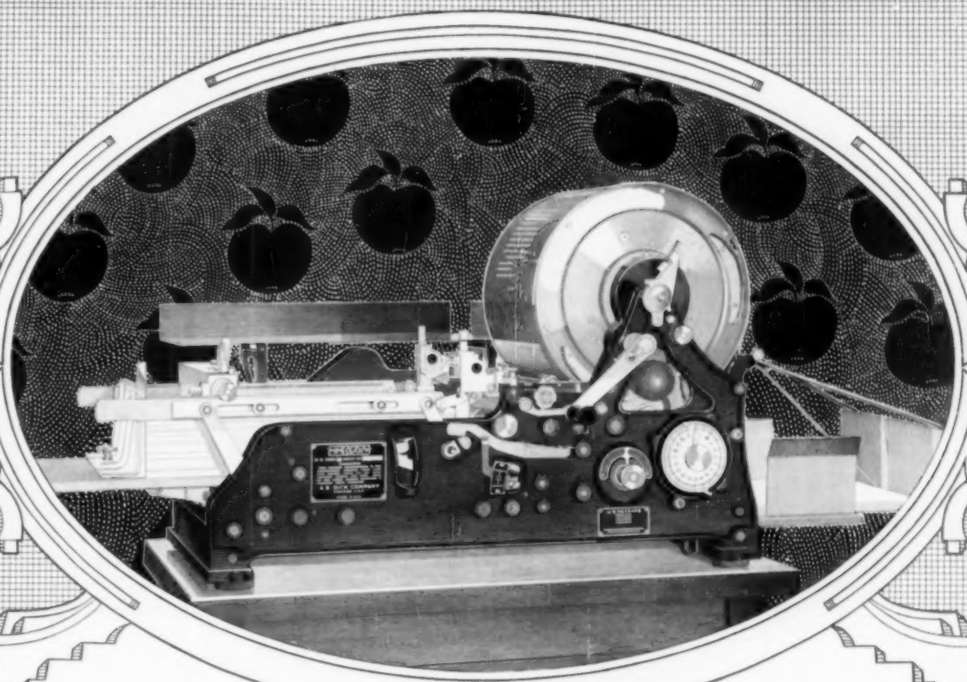
Transcript's Hundredth

AS TYPICAL, as staid, as venerable as a brownstone house on Beacon Street is the Boston *Transcript*, which this year with dignity celebrates its centenary. It is an aristocrat among newspapers and important because in the communities where it circulates aristocrats are important. It is still sufficiently of the old school to continue to print display advertisements on its first page. (The upper left-hand corner is usually reserved for Jay's, the women's wear store on Temple Place.) And it did not admit illustrations until a few years before the War, and none have yet appeared on page one. But it takes its fling at modernity with *Transcript* Sports, which places particular emphasis on horses and yachts (a hobby of Mr. George E. Stephenson, *Transcript* shareholder), and is widely acknowledged as the best section of its kind in Boston newspaperdom.

Publisher of the *Transcript* is George S. Mandell, former intercollegiate hurdle champion, owner of large stables at his estate in Hamilton, Massachusetts. No one outside the family knows how many horses he owns. He is reputed to own more old, broken-down nags than any other fancier of horses. Keen, dynamic, opinionated, aphoristic, Mandell keeps physically in the background of *Transcript* activities. His office is a typical *Transcript* cubby-hole. Smaller than H. T. Parker's (drama) or Edwin Francis Edgett's (books), it measures only ten feet by six and is around the corner from the more mahoganied sanctum of Henry T. Claus, since February, 1925, *Transcript* editor-in-chief. In reply to a protest made by another member of the *Transcript* corporation who thought and said that the publisher should have the biggest office of all, he said, "Oh no. The editor has to meet people. He needs the facilities. I don't."

In adherence to tradition the *Transcript* has been notable. Like the families on Beacon Street, the *Transcript* is dynastic. Founded in July, 1830, by Henry W. Dutton and James Wentworth on the suggestion of Lynde M. Walter, *Transcript* ownership passed upon the deaths of Walter in 1842 and Wentworth in 1847 into the hands of the third partner, remains today wholly owned by his descendants. He had one son, Henry, who died on March 1, 1875. Henry Sr. died six weeks later; leaving the *Transcript* to his four daughters and the widow of his son. The Mandells, Eustises, and Stephensons who now share in the ownership are descendants of these five. (Other Mandells are the widow and children of William P., older brother of George S. The Eustises are five, Mary and Elizabeth, spinsters of Brookline; Tracy, who is vice president of the corporation and who consistently seconds the report of the publisher at the annual meeting; Henry D., who for fifty years has been listed as an employee of the press

[*Continued on page 20*]

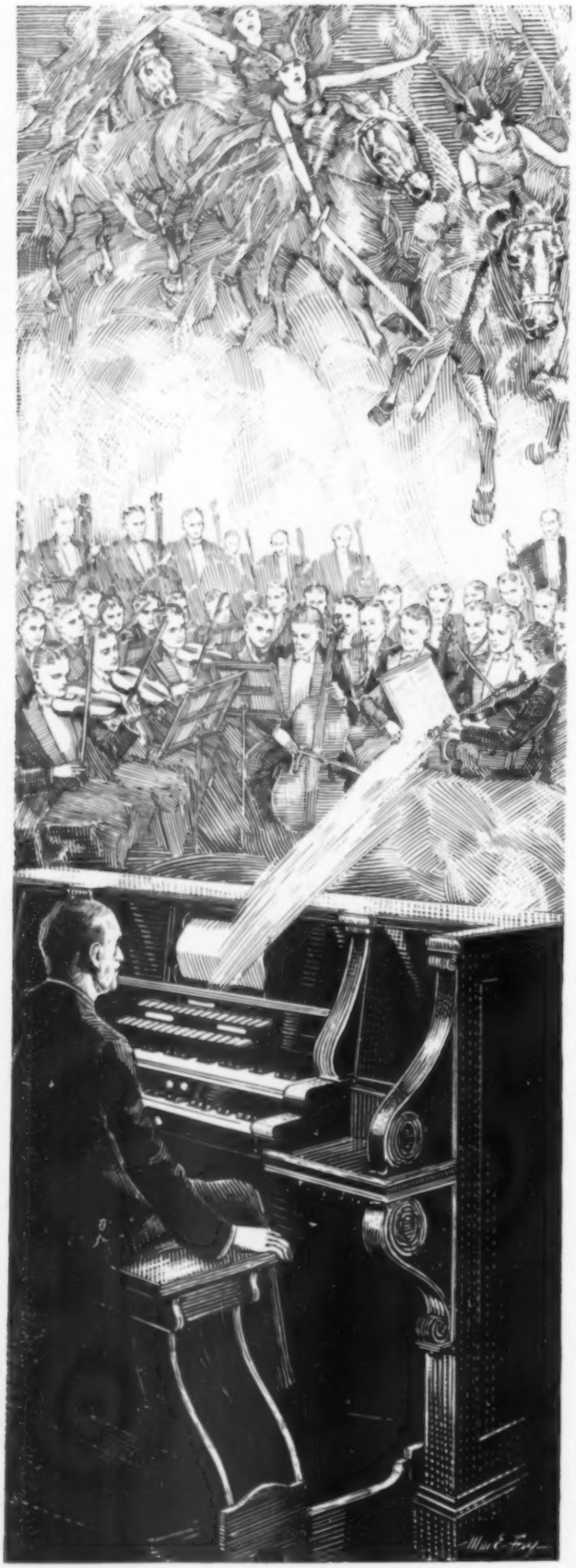


BY ITS FRUIT

More completely automatic than any of its famous predecessors, this newest model Mimeograph is a truly remarkable achievement. But *what it does* is even more remarkable. Not the device itself, *but its product,* is what counts. By its fruit you will know it. Through hour after hour of the working day it duplicates in rapidest thousands all things written, typewritten or drawn in line. It has no peer for speed and fineness of work. It sets a new high mark in mechanical duplication. Letters, questionnaires, charts, graphs, drawings, etc., it produces in limitless quantities. Yet anyone can operate it, because control is ultra-simple. Stand and machine are now a single unit, and the benefits are many. The feeder takes a full ream of Mimeograph paper. Here's volume reproduction, privately done, at little cost. Manifold are its means of time and money saving. Get full particulars from A. B. Dick Company, Chicago, or from branch office in any principal city.

M I M E O G R A P H

EDISON-DICK
MIMEOGRAPH
CHICAGO



YOUR ORCHESTRA playing just to please YOU

. . . a charming Victor Herbert waltz . . . an overture with dash and life . . . some lovely Schubert song you like . . . a swift new fox trot . . .

In the Wurlitzer Residence Pipe Organ, the many voices of the complete symphony orchestra and the dance orchestra are united with the vibrant tonal splendor of the great pipe organ.

You have merely to touch a button . . . and your concert begins . . . as if famous organists were there in your home, playing only for you . . . every melody you love . . . with all the blended beauty of many perfect instruments . . . again and still again . . .

The console of the Wurlitzer Residence Organ is not as large as a grand piano . . . the price of this distinguished instrument has never before been equalled . . . the charm of its presence adds new richness to your home.

Hear this pipe organ, and play it yourself, at your nearest Wurlitzer Studio . . . New York, Buffalo, Chicago, Detroit, Cincinnati, Cleveland, Los Angeles, or Pittsburgh.

A beautiful brochure, with photographs of installations, may be obtained from any Wurlitzer store.

WURLITZER
Reproducing
Residence Pipe Organ

The price — $6500 and upward

DISTINCTION

AS DISTINCTIVE as the Bird of Paradise, the New Firestone Supreme Balloon adds a definite beauty to the finest of motor cars. Constructed entirely of superlative materials, built slowly and painstakingly, it represents the final word in dependability, riding comfort and mileage. The tread is wider, thicker, tougher. The Gum-Dipped cord construction has never been equalled for strength and stamina. The polished, ebony-black appearance, enhanced by two rich gold stripes around the side-walls, makes the Supreme Balloon look as good as it really is. A tire to match the finest, fleetest motor cars.

Firestone

Supreme Balloon

Copyright, 1930, The Firestone Tire & Rubber Co.

The Thrill of Winged Flight
whether in aeroplane or modern runabout, which is virtually a water plane, is similar in both.
A 200 horsepower Sterling Petrel engine drives this Sea-Lyon runabout at over 40 miles per hour. That the thrill may be prolonged, continued on indefinitely, as you will, this Petrel is built 16% larger (779 cubic inches) and with greater power at useable revolutions — 2000 R.P.M.
(Any comparable engine, of 678 cubic inch piston displacement, must turn 300 to 500 revolutions faster, with tremendously increased effort, to equal the Petrel.)
The Sterling Petrel's fuel consumption is satisfactorily less per mile. . . . . It is safely carbureted.
STERLING ENGINE COMPANY
1970 Niagara Street
Buffalo, N.Y., U.S.A.
12 to 565 H.P.
DOUGLAS DONALD

W. H. Moreton Corp., 1043 Commonwealth Ave., distributors, Boston

Bruns, Kimball & Co., 5th Ave. at 15th St., distributors, New York

Wood block engraving by Howard McCormick from mural by Arthur Covey.

GREAT MANUFACTORIES, towering skyscrapers, moving trains and motors, mighty ships — achievements of man that typify the work of the grinding wheel.

Yesterday, the mechanic with steel against steel slowly and laboriously milled his stock.

Today, grinding wheels and grinding machines made by Norton Company, Worcester, Mass., fashion even the hardest steel alloys to mechanical perfection on a mass production basis.

NORTON — Grinding Wheels . . Abrasives for Polishing . Pulpstones . . . Floor and Stair Tile
Grinding and Lapping Machines . Refractories . . Porous Plates . Abrasive Aggregate

The New York Trust Company

Capital, Surplus and Undivided Profits $47,000,000

DOMESTIC
and
FOREIGN BANKING
FACILITIES

CORPORATE
and
PERSONAL TRUSTS

---

100 BROADWAY

40TH STREET AND MADISON AVENUE

57TH STREET AND FIFTH AVENUE

$82,000 Decrease in Advertising

MAKING POSSIBLE THE EMPLOYMENT OF 18 ADDITIONAL SALESMEN

Led to a 252% Sales Increase

THIS is the account of an experience that drove home the need of a fee system in advertising and merchandising work. It deals with an important specialty sold to men.

The special problem calling for a new plan arose from a demand on the part of the Board of Directors for a large and immediate increase in volume. A complex set of conditions made that imperative. Advertising and sales cost was secondary to mass production.

Within a few days after the Board had voted $300,000 for advertising—double the previous maximum—the president of the company selected a new group of advertising and marketing consultants to work with him. His former agency had specialized in "atmosphere" and suggestive copy. His new agency favored the use of strong selling copy with a direct personal appeal to the prospect.

A factor in his selection was his acquaintance with an individual in the agency who had taken a deep interest in proper "balancing" of marketing efforts and had demonstrated in several successes a flair for that type of planning.

The first step initiated by this man was an examination of sales records. How many classes of dealers and wholesalers? What breakdown by geographical units? By size and rating of stores? By size-groups of cities and towns?

Just how close to par was this company in each sector and subdivision of its market? Where were the salesmen spending their time? Just what were they accomplishing against par? Were calls too infrequent? Or too frequent and too costly? What would be an "ideal" sales plan under the existing conditions? How many and which stores should be sold direct—when and how?

A survey covering these and other questions resulted in two tables: an evaluation of the market and its logical units, using five basic factors to show total consumption in each area; a sales set-up calling for thirty men, eighteen to be added at once.

Before the president had finished reading the report he said, "This seems unreasonable. We allow $300,000 for advertising and give you the business without effort on your part. Then before you make a move on the advertising, you ask us for some $80,000 additional for 18 new men. That is not what we expected of you!"

It was suggested that he note the budget in the summary. There he found the advertising had been cut to $218,000 and the money for the new men obtained without increasing the total.

The details of this plan are another story. By September volume had doubled the best previous year. He then allowed an additional $100,000 for advertising—on his own initiative—and ended the year with an increase of 252%.

THE man who directed that operation is today a partner in Cowan & Dengler. That job left an impression not to be forgotten—the conviction that in due time executives would sense the value of unbiased service.

Under the Cowan & Dengler Fee System a complete separation is made between the client's appropriation and the Retainer or profit. The client may spend more or less without affecting the Retainer.

The client may divert part of his budget to the employment of additional men or to use of non-commissionable advertising without affecting our profit.

When general business shows a downward trend as in the Spring of 1930, the client may expect us to propose a proper reduction in his expenditures and the setting up of a reserve to be used when he can cash in at a higher rate of return.

In short, we have attempted to provide an unbiased service and to correct the disadvantages inherent in the common agency-client arrangement.

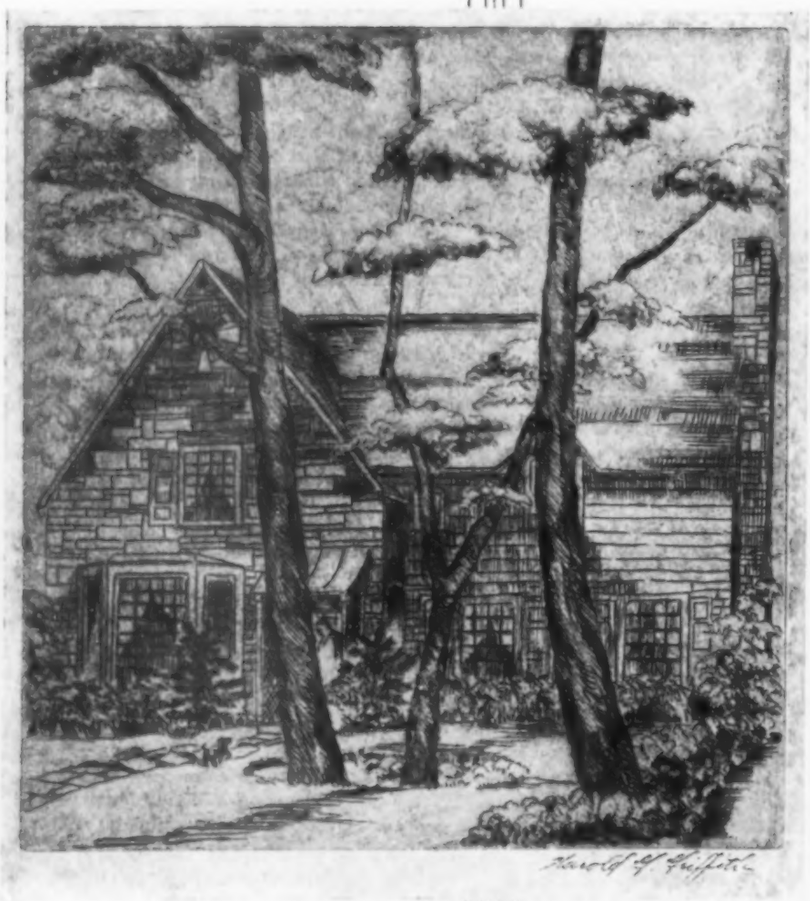
This plan is not designed to "save the advertiser money," in the narrow sense. Often the first cost is more. But measured by advertising cost per dollar of sale it often produces a saving. In some cases, a substantial saving or a large increase in profit.

COWAN & DENGLER

ADVERTISING • MERCHANDISING • SALES COUNSEL

NEW YORK

IF YOU WANT BETTER LIVING CONDITIONS



©G. T. Co.

CLEVELAND offers health, recreation, culture and education for the families of the business man and his employes. In the center of the "maximum energy belt" of the United States, it not only has a low death rate—10.2 per thousand as compared with a 1928 average of 13 for 66 large cities—but also minimizes economic waste due to illness and sets a high standard of vital, purposeful living.

¶Cleveland's recreational system includes 11,000 acres of parks, in a 90 mile system that surrounds Greater Cleveland and includes boulevards, camp grounds, bathing beaches and golf courses.

¶Cleveland's facilities for education and culture include one of the nation's leading symphony orchestras, three excellent museums, a comprehensive library system, three colleges and three universities. Its public school standards are unusually high. Its living costs are low; and in its extensive suburbs, homes are found in a wide range of choice.

¶Good living conditions comprise one of the ten main factors in selecting a strategic location for a business. For specific data regarding any or all of these factors, write this Bank.

GUARDIAN TRUST COMPANY

CLEVELAND, OHIO

RESOURCES MORE THAN $165,000,000

An inviting, livable office used to be the exception. Today, such an office has become the rule, for the executive and professional man.

Many who have felt this trend of the times are wondering how their present, conventional offices could be transformed, or how their newly leased quarters should be decorated and furnished. To such men, our staff offers definite assistance.

This organization plans office layouts, designs the interiors, executes the decorations and provides the furniture; coordinating every detail to assure a harmonious result.

Designs and suggestions will be furnished, without obligation, to interested executives

The William F. Wholey Co. Inc. (Equipment Specialists) 11 East 36 St. New York

when building to RIGID SPECIFICATIONS your product Must be Right

WHETHER you build to the rigid standards of government specifications—or to meet the keen competition of present day business you must know your product is right.

Specifications are too exacting—competion too keen—for the unaided human eye to judge quality of product and accuracy of manufacture. As a result increasing numbers of manufacturers are turning to Bausch & Lomb, America's leading Optical Institution, for those optical aids that will help them produce a finer, more accurate product.

For laboratory control, for fine inspections and for the most precise determinations and measurements, Bausch & Lomb Optical Instruments are unexcelled. A new accuracy is combined with modern Industrial Methods.

Let our long experience and wide knowledge of precision methods help you maintain your guarded reputation.

Manufacturers of
Optical Precision Control
Instruments

▼

Also of
ORTHOGON
Eyeglass Lenses for Better Vision

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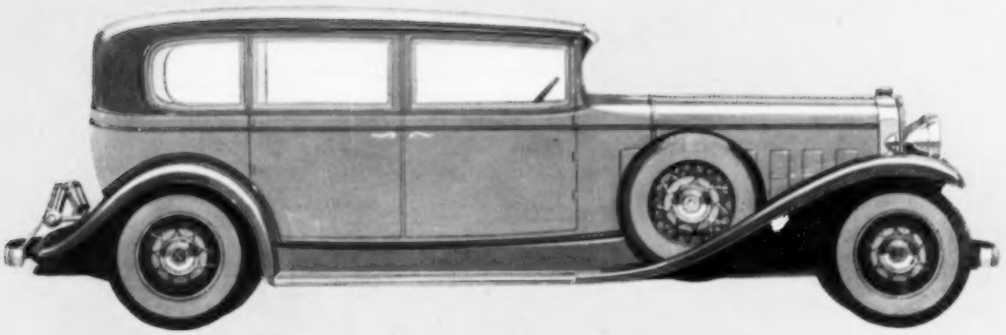
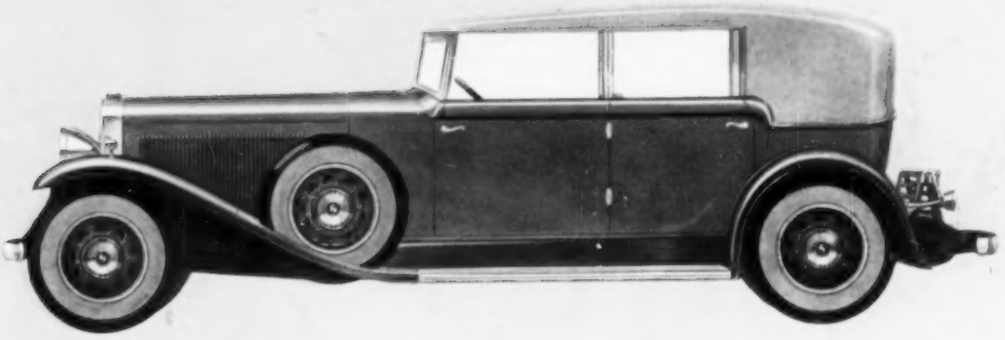




The New CADILLACS — The New LA SALLES

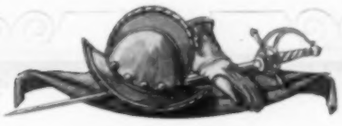
Out of an experience which produced the Cadillac V-16 and which has built more than 600,000 fine cars come these new Cadillac and La Salle V-Eights, fruit of the greatest manufacturing program in Cadillac's history

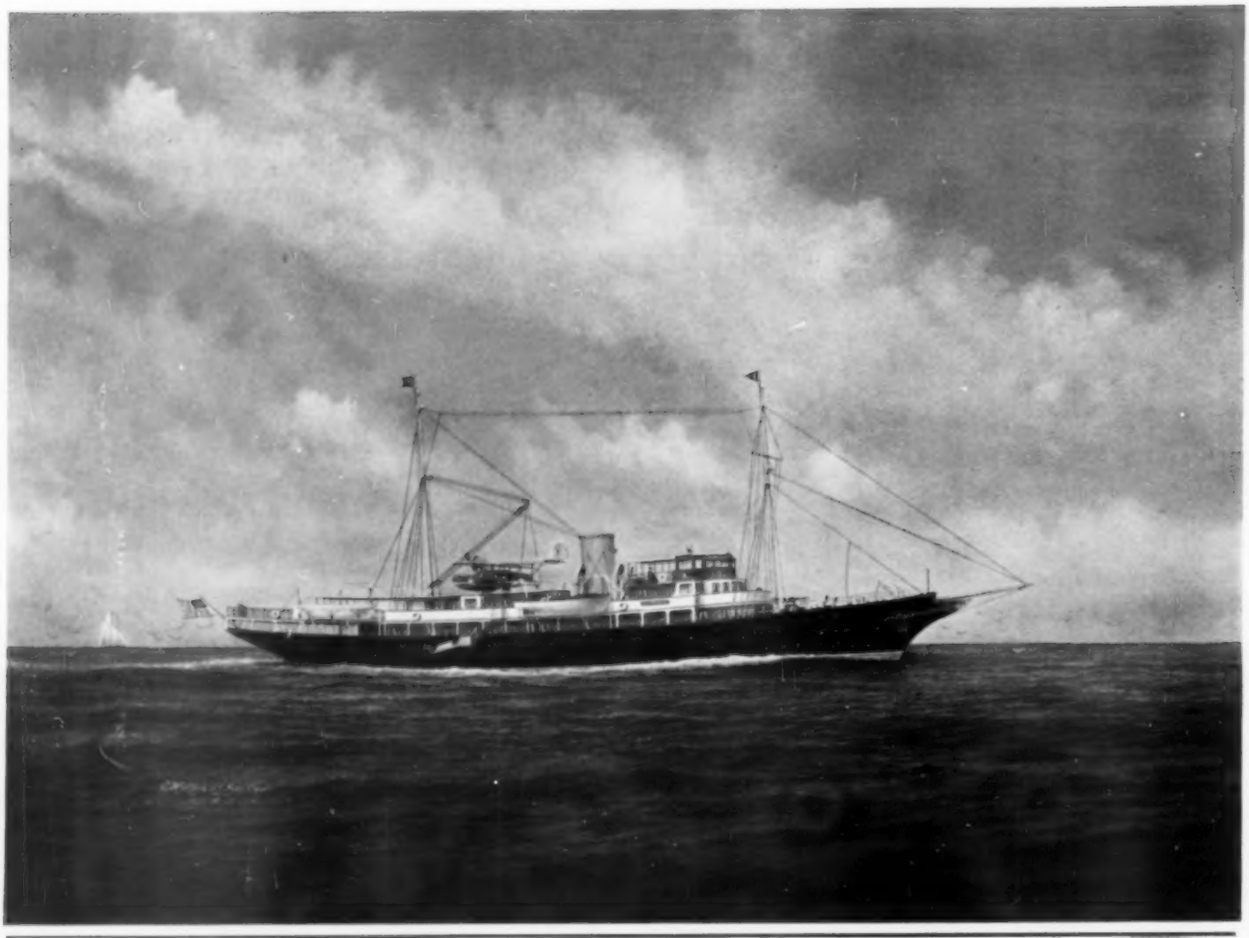
PRICES RANGING FROM $2195 TO $3795 F. O. B. DETROIT

Prices Lowered from $245 to $900

Bodies by Fisher and Fleetwood

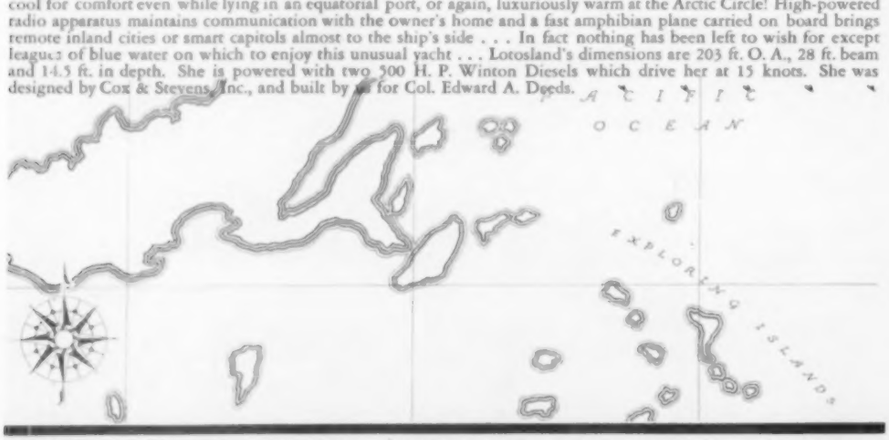
The Cadillac complete line will consist of La Salle V-8, Cadillac V-8, Cadillac V-12, Cadillac V-16, ranging in price from $2195 to $15,000, f. o. b. Detroit. The G. M. A. C. Deferred Payment Plan is recommended to the purchasers of any of these cars





LOTOSLAND

Without doubt, *Lotosland* is one of the most remarkable pleasure craft that ever left the ways. While she embodies all that yachtsmen admire in beauty of line and dimension, concealed in her graceful hull are the most advanced ideas for the operation of the ship and the comfort of her guests afloat . . . At the touch of a button your cabin may be made too cool for comfort even while lying in an equatorial port, or again, luxuriously warm at the Arctic Circle! High-powered radio apparatus maintains communication with the owner's home and a fast amphibian plane carried on board brings remote inland cities or smart capitols almost to the ship's side . . . In fact nothing has been left to wish for except leagues of blue water on which to enjoy this unusual yacht . . . Lotosland's dimensions are 203 ft. O. A., 28 ft. beam and 14.5 ft. in depth. She is powered with two 500 H. P. Winton Diesels which drive her at 15 knots. She was designed by Cox & Stevens, Inc., and built by us for Col. Edward A. Deeds.



THE PUSEY AND JONES CORPORATION

Shipbuilders Since 1848—WILMINGTON, DELAWARE

Distinguished yachts recently launched at the yards of The Pusey and Jones Corporation

RENE

Length 236 feet

Owners:
THE RENE CORPORATION
NEW YORK

Architects:
COX & STEVENS, INC.
JOHN H. WELLS, INC.

CAMBRIONA

Length 236 feet

Owner:
W. O. BRIGGS, ESQ.
DETROIT

Architects:
COX & STEVENS, INC.
JOHN H. WELLS, INC.

NAKHODA

Length 236 feet

Owner:
FRED J. FISHER, ESQ.
NEW YORK

Architects:
COX & STEVENS, INC.
JOHN H. WELLS, INC.

VERMONT MARBLE

has
the STRENGTH
of the
EVERLASTING
HILLS

THE illustrations on this page give evidence of the high regard in which the beauty and the permanence of Vermont Marble are held by American architects. Above is the facade of the recently completed Olin Memorial Library, Wesleyan University, at Middletown, Connecticut. It was designed by the architectural firm of McKim, Mead & White. At the left is an example of modern memorial architecture which stands against the charm and loveliness of a typical Californian background. And below is an unusual view of America's greatest shrine, the Arlington Memorial Amphitheatre on the Potomac, designed by Carrere & Hastings, and dedicated forever to the memory of the heroic dead who gave their lives in the service of their country.

Vermont Marble is appropriately and effectively used today not only in public buildings, community memorials, and educational institutions, but also in increasing measure in homes and gardens — bringing to these the charm and serenity which characterize the notable estates of the old world.

Write for the free booklet, "All That is Beautiful Shall Abide Forever" . . . It gives helpful information on the problem of selecting appropriate memorial designs. Our Department of Plan and Design will gladly co-operate with a Master Craftsman in Marble in your vicinity, without obligation, in submitting sketches and estimates for cemetery memorials . . . Address: Dept. F 304, Vermont Marble Company *(the world's largest quarriers of marble)*, Proctor, Vt.

IN *addition to the distinctive beauty of Vermont Marble . . . is its resistance to the wearing effects of climatic conditions. Of these, the most destructive during the course of centuries is moisture. Bulletins of the governmental Bureau of Standards show that Vermont Marble absorbs only about one-third as much water as the average of other memorial stones. Vermont Marble is imperishable and is everlasting.*

Gentlemen's Clothes

OF CHARACTER

FOR SPORTSMEN & UNIVERSITY MEN

Style developments in gentlemen's clothes, for which the house of Tripler has gained the preference of sportsmen and university men, are expressed in our presentation for fall wear, tailored from woolens representing the world's finest makers

OUR CLOTHES ARE TAILORED FOR US BY HICKEY-FREEMAN

F. R. TRIPLER & CO.

Outfitters to Gentlemen · Established 1886

MADISON AVENUE AT 46 STREET

New York

department, comes to work daily in a limousine, dons overalls and bales waste paper in the pressroom; and Mrs. Martha Eustis Stephenson of Philadelphia. George E. Stephenson, her son, is assistant treasurer.) George S. Mandell and Tracy Eustis, grandsons of Henry W. Dutton, together with great-grandsons Thomas P. Mandell and Stephenson, are active, the others passive in the management.

The *Transcript* is one of the few remaining institutions in the Fourth Estate. Its circulation is smaller than that of some other Boston newspapers, but in dignity and importance it admits no equal. Boston is full of *Transcript* stories that reveal in exaggeration the peculiar position which it occupies in Boston life. Among these is one which tells of the arrival at a Beacon Street mansion of representatives of five Boston dailies who had come for information concerning the last hours of the life of a prominent Bostonian. They were admitted to the reception hall by a butler who immediately excused himself and went to the foot of the stairs whence he called to the great man's widow upstairs, "There are four reporters down here, madam, and a gentleman from the *Transcript*."

Latest additions to the store of *Transcript* anecdotes came from the festivities attending the centenary celebration. A special issue, for the *Transcript* staff birthday dinner, contained tributes to loyal *Transcript* employees. Robert Lincoln O'Brien, publisher of the rival *Traveler* and one-time *Transcript* editor (1906-10) contributed a fulsome and reminiscent article about Mandell himself which was thus laconically declined by telegram:

SORRY CANNOT USE BECAUSE OF OUR POLICY NOT TO PRINT MISLEADING ADVERTISING

Proud of its tradition, the *Transcript* has entered its second century with reiteration of its policy to "print sensation because it is news and not news because it is sensation," and in typical *Transcript* prose thus characterizes its present and prophesies its future:

"Quick to sense new currents in life and thought, the *Transcript* marches in the van of progress without sacrifice of dignity or self-respect. To the flapper, male or female, it makes no appeal. To men and women in all walks of life who are earnest in their work, clean in their play, and thoughtful in the hours between, it is, as of old, counsellor and friend. It differentiates solids from froth, the permanent from the passing, substance from shadow. In a yeasty newspaper generation plagued by real and imitation yellow journalism, it affords abundant proof that enterprise and serious purpose may go hand in hand to ever new prosperity and success."

$3.00 Up

LSHERMAN ADAMS, one of Boston's best-known brokers, has cultivated a most profitable habit. Almost every week he drops in at the security auctions held in the rooms of the Boston Real Estate Exchange. He quietly smokes a cigarette as one lot after another of apparently worthless securities is put up for sale. A nod of his head registers his bid. One day in 1927 such a nod made him owner of 1,000 shares of Wire Wheel Corp. at $3.00 for the lot. Shortly after, the company was reorganized, and his $3.00 worth of stock was worth just over $116,500. The auction sales which Mr. Adams so profitably attends are a weekly feature in Boston's financial life. The securities to be offered are announced in the newspapers, and such bankers, brokers, and others as are interested drop in to see what they can pick up. Bids of $1.00 are by no means unknown, and often there is no bid at all. The sales are especially heavy toward the end of the year when investors are getting rid of their lame ducks in order to charge them off as losses on their income tax returns. Mr. Adams is a shrewd trader. Other brokers were aghast when he took on large blocks of Eastern Massachusetts Street Railway, became in fact its largest stockholder, at a time when that company was thought to be one step ahead of the sheriff. And they were also somewhat aghast when Mr. Adams made a considerable amount of money out of the transaction.

DO YOU WORK IN *THIS* KIND OF LIGHT . . . *OR THIS?*

*MAZDA
the mark of a research service

GOOD LIGHT will help your employees to do their work speedily and accurately. If people in your establishment are slow in getting their work done, or if they make many mistakes, poor light may be to blame.

Edison MAZDA* Lamps are made of the finest materials obtainable and with an accuracy that assures *full value of the current consumed*. They bring you the benefit of fifty years of progress in electric lighting.

Examine the lighting conditions under which your employees do their work, then write to the Engineering Dept., Edison Lamp Works of General Electric Company, Nela Park, Cleveland, O., and we shall be glad to send you free bulletins concerning proper illumination in your particular kind of business.

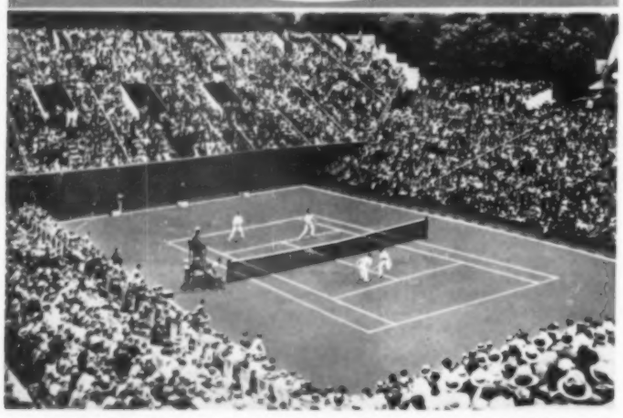
EDISON MAZDA LAMPS

GENERAL ELECTRIC

PLAY TENNIS

30 minutes after rain . . . at twilight
. . . weeks earlier . . . weeks later

En-Tout-Cas
FAST DRYING TENNIS COURTS



John Van Ryn and Wilmer Allison vs Henri Cochet and Jacques Brugnon in the 1930 Davis Cup Matches on "En-Tout-Cas Bouhana" courts at the Stade Roland Garros, Paris, France.

CHOICE OF CHAMPIONS

"En-Tout-Cas" courts are the original fast drying tennis courts. Since 1912 thousands of these courts have been in use in England, on the Continent and the United States. The imported surfacing material of patented processed clay is laid over a resilient and quick draining foundation, which gives extraordinary advantages.

A Few "En-Tout-Cas" Successes

The Davis Cup (Finals or Challenge Round)
1929-30-31 on "En-Tout-Cas Bouhana" Courts at the Stade Roland Garros, Paris.

The French Championships
1929-30-31-32 on "En-Tout-Cas Bouhana" Courts at the Stade Roland Garros, Paris.

The Davis Cup Matches
1928-29 on "En-Tout-Cas Bouhana" Courts at the Rot-Weiss Club, Berlin.

The British Hard Court Championships
1930-31-32-33-34 on "En-Tout-Cas" Courts, West Hants Club, Bournemouth.

The Davis Cup Matches
1930 on "En-Tout-Cas" Court, Chevy Chase Club, Chevy Chase, Md.

Canadian Indoor Tennis Championships
1929 on "En-Tout-Cas" Courts at the Montreal Indoor Tennis Club.

Ideal for Indoor and South

The perfect playing surface of "En-Tout-Cas" and "En-Tout-Cas Bouhana" is similar to turf and ideal for indoor courts, as a great many prominent owners will tell you. Wonderful for the South—no glare—no dust—no long waiting after a heavy shower and the dull red or green color harmonizes with the landscape plan.

Illustrated Booklet R sent on request

Sole American Agents

H. A. ROBINSON & CO., Inc.

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Robert Hunter, Jr., 1530 Latham Square Building, Oakland, California
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Sole Makers and Patentees
THE EN-TOUT CAS CO., (SYSTON), Ltd., England
Patented in Great Britain, U. S. A., Canada

Off the Record—*Continued*

A Letter

To the Editor of FORTUNE

Dear Sir:

In accepting your invitation to set forth the basis of our adverse criticism of your article entitled "Cloak and Suit," published in your June issue, we . . . shall not enumerate such misleading matter as the photograph of a negro girl presser although these are unknown in the coat and suit industry and comprise less than 5 per cent in the dress trade, nor shall we make mention of your wholly exaggerated comment that ". . . every garment man goes eventually into real estate." Your subheading refers to our industry as one "without leadership and without stability."

That our industry has witnessed a number of successful experiments in coöperation between workers and employers was entirely overlooked in your article, which was quite specific as to strikes and violence . . . In discussing the settlement of the strike of last year, you did not report the establishing of a Commission . . . to make certain that wholesome standards of employment are maintained. You said nothing whatever of the great philanthropies of the employers. . . . You omitted also allusion to the Central Needle Trades School in which many of our manufacturers take an active interest . . . The influx of numerous young and well educated Americans into our industry in the past several years received no notice whatever. You named pinochle as a chief outside interest of the members of our trade but you left unsaid the membership of so many manufacturers on the boards of trustees of hospitals, orphan asylums and other charitable institutions . . .

As far as the statistics in your story are concerned, they . . . cover, in some cases, the men's as well as the women's clothing industries. There are many obvious incongruities. For example, it is said that 153,743 workers produced in 1909, a product valued at $384,000,000. Last year, it is stated, the number of workers had increased by only a thousand — 154,459 — but the value of their product had gone up to a billion and a half. Similarly, in another part of the article, it is said that 94,000 workers in New York account for $1,439,213,761 worth of the industry's $2,573,900,000 total. Brooklyn's workers — 17,380 — add something over $50,000,000 to this figure. Obviously, however, if seventeen odd thousand workers in Brooklyn account for a product worth only $58,000,000, 94,000 workers in New York cannot account for a product worth one and one half billions . . . Your writer estimates, also, that about 60 per cent of the country's production of women's cloaks and suits are made in New York. The percentage is closer to 75. . . . In 1914, 73.83 per cent of the national production was in New York City; in 1921, it was 78 per cent. . . [Mr. Klein states that the FORTUNE writer apparently did not use the report of the Governor's commission.]

The same criticism can be brought to bear on your estimate of average wages. I do not know what you mean by the statement that garment workers average $24.51 per week . . . The report of the Governor's advisory commission showed that in 1924 the average annual earnings of cloak and suit workers in inside shops was $2,016. In 1925 they fell to $1,874. In the sub-manufacturing shops, workers in 1924 had average annual incomes of $1,675, but in 1925, only $1,375. The special computation made for the shops belonging to the Industrial Council for the year June 1, 1928 to June 1, 1929 showed that the average annual earnings for workers in all crafts were $2,058 . . .

Very truly yours,
Samuel Klein, Executive Director, Industrial Council of Cloak, Suit and Skirt Manufacturers, Inc.

Because of limited space FORTUNE obviously could touch only upon what seemed to be the industry's most important and "individual" phases. From a number of conflicting statistics, including those in the source material to which Mr. Klein has reference, FORTUNE chose those which seemed, and still seem, most reliable and impartial.—Ed.

CREDIT

Credit should have been given to Kennedy & Co. for the use of the colored print of early English railway carriages reproduced on pages 62-63 of the July issue of FORTUNE.

2,900,000 New Customers Added to Your Western Market Since 1920

—a total market today of Twelve Million People in the eleven Western States...an increase of 32% in ten years.

Oregon, Washington and California combined, increased 2,596,005 **46%**

California alone increased 2,226,784 **64%**

Southern California increased 1,630,333 **107%**

Los Angeles County increased 1,263,202 **134%**

Population Now 2,199,657

More than half the increase of 2,920,000 in the eleven Western States occurred in Southern California. The manufacturer who considers distribution costs carefully will readily see the advantage of locating his plant in this concentrated market . . . from which the entire Western market is served at lowest per capita distribution cost.

Industrial LOS ANGELES COUNTY

Manufacturing Executives Are Invited to Write to the Industrial Department, Los Angeles Chamber of Commerce, for Detailed Information Regarding this Great Western Market

THE BRICK AND THE SCARAB

When ordinary letters were picture drawings on sun-dried bricks, Pharaoh of Egypt, ruler of the civilized world, communicated with his satraps by messenger. His authority and prestige was represented by a scarab, symbol of eternal life, carved from a jewel and engraved with his signature.

Some business firms by the inferior quality of their stationery still suggest the letter scratched on the crude brick. Others see the wisdom of the symbol of the scarab and put their signatures on Crane's Bond only.

Crane's Bond unfailingly carries a prestige message. Wherever your letters go, it will bespeak your good taste and the high standing of your business.

CRANE'S BOND

for letterheads and envelopes

CRANE & CO., Inc. • DALTON, MASS.

Statistics

Community chests depend upon manufacturing and retail business for some 22 per cent of their funds. Of these 47.2 per cent come from manufacturing companies, 2.9 per cent from chains (who usually contribute only where public opinion needs smoothing), 17.1 per cent from banks and trust companies, 22.4 per cent from retailers and wholesalers, 7.4 per cent from public utilities other than transportation.

. . .

The Senate, with ninety-six members, runs up a cleaning bill for its corridors and offices of some $150,000, while the bill for keeping the House of Representatives' building (435 members) is $90,000.

. . .

The operator of a Japanese typewriter requires a directory at his elbow to guide him in finding the more unusual of the 7,000 characters on the machine. If he is expert, he can reach a speed of 60 words a minute. It is not quite fair, however, to compare this with the speed record for American machines, held by George L. Hoffield of Paterson, New Jersey, with 675 letters, 135 words a minute. A Japanese character may express many words, one click of the key inscribing the "old purple hat of my grandfather."

. . .

About $13,000,000 are paid yearly in wages to Canadians working in U. S. factories near the border, and some $250,000,000 are sent each year by U. S. wage earners to Europe to support friends or relatives. In 1920 the huge sum of $700,000,000 was sent to relatives by U. S. workers. Within the last ten years an estimated total of $4,000,000,000—far greater than the gold movement in the same period—went to Europe from immigrants in the U. S. The average yearly remittances, $250,000,000, exceed what the U. S. receives in principal and interest on war debts. Immigrants entering the U. S. bring with them each year an average of $25,000,000.

. . .

Large factories are safer places in which to work than small ones. Of 1,485 studied in Greater New York, those employing over 100 men had 18.08 accidents per million man-hours. Factories employing less than 100 had 22.36 accidents per million man-hours—almost 25 per cent higher frequency rate.

. . .

The U. S. windmill business would indeed be wretched were it not for exports. In 1922, 15 per cent of the total production of windmills, not including any parts, was exported. Last year 44 per cent went out of the country, largely to the Argentine. Total value of the industry declines but little in spite of competition with internal combustion engines—$4,125,000 in 1928 to $4,063,000 last year.

. . .

A wedding, well done, in New York costs between $50,000 and $100,000. A few items which contribute to the total: 5,000 invitations: $5,000; organist: $350 to $1,000; singer: $150 to $1,000; 300 pews properly decorated: $4,500; altar decorations bring the total to $7,500; food: $7,000; orchestra: $1,000; bridal clothes between $5,000 and $10,000; bouquet—for the bride: $100, for the attendants: $20 apiece. Attendants' costumes and gifts add a few thousands more. Fee to the minister: $500; gift to the church: perhaps $500. Smaller items: marriage license: $2.00; use of the church: $25; canopy: $30; tips to traffic policemen: between $25 and $150.

. . .

Railroads proudly boast that the average speed of freight trains has increased from 13.8 to 13.9 miles per hour in the last few months. Average daily movement per freight car is about thirty miles—a figure made low by including all cars in service, those waiting for a load, being unloaded, being loaded, and being repaired.

department stores do . . . banks do . . . theatres do . . . office buildings do . . .

Now CRACK TRAINS

will offer Summer Patrons

COOL, REFRESHING WEATHER

INSIDE—WEATHER PLEASANT as that of a mountain resort, Santa Fé's flyer, "The Chief," may speed through desert or under scorching sun, but the diner is cool and refreshing, because of Manufactured Weather.

OUTSIDE—WEARYING, WITHERING HEAT. Now this bane of summer travel can be removed with Manufactured Weather, which also washes out dust and cinders, and reduces humidity to the comfort point.

ALREADY, important office buildings, banks, department stores and theatres are providing real summer comfort for their patrons—with Manufactured Weather.

Now, you can enjoy this same cool and refreshing weather when you travel. "The Columbian" of the B & O lines between New York and Washington carries "The Martha Washington," the first air conditioned diner—and "The Chief," crack train of the Santa Fé carries Diner *No. 1418*, the first transcontinental air conditioned car.

Clicking along over the rails from Chicago to Los Angeles, or from New York to Washington, you enjoy an atmosphere as clean and pleasant as an outside cabin on an ocean liner, cruising through perfect weather . . . as refreshing as if you were thousands of feet above the earthbound dust and heat.

Recently, during the terrific heat wave, as "The Chief" sped across the burning Mojave Desert, passengers were amazed and pleased to find the diner cooled to 37 degrees below out-of-door temperature.

There are no cinders . . . no dust . . . because the air is cleaned. No door or window need now be opened. Muggy, uncomfortable air is dehumidified. And all the time, this pleasant, *conditioned* air is kept in gentle, draftless motion.

Manufactured Weather opens up untold possibilities for railroads themselves. Larger revenues from increased passenger traffic . . . both business and vacation. Public preference and enhanced reputation for the road that offers patrons weather that is always comfortable.

Manufactured Weather is the name given exclusively to the conditions of air comfort produced by the systems of the Carrier Engineering Corporation. A request to our Newark office will bring you full information about what it is doing in *your business field*.

Carrier Engineering Corporation

NEWARK, NEW JERSEY

OFFICES: New York, Philadelphia, Boston, Chicago, Cleveland, Washington, Detroit, Dallas, Los Angeles

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LONDON, PARIS, BOMBAY, CALCUTTA, JOHANNESBURG

CARRIER LUFTTECHNISCHE GESELLSCHAFT
STUTTGART, BERLIN

Manufactured Weather *makes* "Every day a *good* day"

Imitations
never quite succeed in being
WOOD . .

THE BEAUTY of well-finished wood cannot be imitated. Curves, swirls, and patterns artificially imposed on alien surfaces are cold, mechanical . . . lack the "natural" charm of wood.

In the executive office, where dignity and good taste are paramount, wood furniture is essential. The finer period desks and chairs can be obtained *only* in wood—master craftsmanship does not adapt itself to unwieldy substitutes.

All employees prefer wood furniture . . . Throughout the entire organization the charm and friendliness of wood equipment encourage efficiency.

Wood office furniture is stronger, pound for pound . . . quieter . . . does not deteriorate, corrode or bulge out of shape . . . lasts indefinitely. ***And wood desks actually protect papers and valuable data from fire better than do desks of substitute materials.***

The leading American manufacturers of wood office furniture provide a wide range of appropriate models—period suites for executives . . . desks and chairs for other employees . . . furniture for all office needs. Consult your local dealer.

SEND for the free booklet, *"Planning the Modern Office in Wood,"* which contains complete data on office planning, and a handy chart that will help you lay out an attractive, efficient office to meet your individual requirements. WOOD OFFICE FURNITURE ASSOCIATES, INC. Affiliated with the National Lumber Manufacturers Association.

An executive office of the STANDARD OIL COMPANY (NEW JERSEY) *Furnished with wood office furniture, this room has beauty . . . personality . . . character.*

The stenographic room, GENERAL OUTDOOR ADVERTISING COMPANY, *New York City. Large organizations everywhere find that employees prefer the warmth and friendliness of wood office furniture.*

WOOD OFFICE FURNITURE

Wood Office Furniture Associates, Inc.
Dept. 310, 420 Lexington Ave.
New York City

Gentlemen: Send me the free booklet, "Planning the Modern Office in Wood."

Name_____

Address_____

City_____ State_____

WORLD CRUISE
... *but*
HOW?

• MADEIRA
Residents' Ball . . .
• ALGIERS
Windowless houses . . .
• ATHENS
Shrine of beauty . .
• BETHLEHEM
for Christmas . . . .
• CAIRO
New Year's Eve . .
• INDIA
The Taj Mahal . .
• CEYLON
Rubies, bullocks . .
• SUMATRA
Pointed roofs . . . .
• JAVA
Flower mountains
• SIAM
White elephants . .
• CHINA
Swarming East . . .
• JAPAN
Massive Buddhas .
• AND 10
other countries . . .
• IN 137 DAYS,
From $2000 . . . . .
• YOU LEAVE
winter behind . . .
• DEC. 2
from NEW YORK

• WILL you take it hop-skip-and-jump? Or will you entrust it to the world's greatest travel system? On this Canadian Pacific world cruise you have (1) a high-spot itinerary of 137 days . . . (2) an all-spring calendar . . . (3) the distinguished 21,850-gross-ton Empress of Australia . . . (4) service of an English manor, cuisine of the finest Paris restaurant. You do nothing but enjoy because of this "5th Ace" . . . Canadian Pacific's world net-work of rail, ship, hotel, and key-city offices . . . gigantic resources to serve you in every port. Eighth season. As low as $2000. Booklets, ship plans, from your own agent, or any Canadian Pacific office: New York, Chicago, Boston, Philadelphia, Montreal, and 30 other cities in United States and Canada.

WORLD'S GREATEST
TRAVEL SYSTEM

Canadian Pacific

CAUSE

One of the youngest of the great rubber companies, Goodyear realized early in its career that if it was to attain any considerable success it must outstrip the rubber industry in rate of growth.

It has sought steadily to deserve such special growth by pacemaking the art of rubber manufacture, by keeping ahead of the industry in invention, design, development of methods and material.

An example of this endeavor is seen in such important Goodyear achievements as the straight-side tire, the tire-making machine, the multi-ply cord tire, the All-Weather tread, Supertwist cord, the Double Eagle *super*-tire, balloon tires for buses and trucks, the new aviation Airwheel.

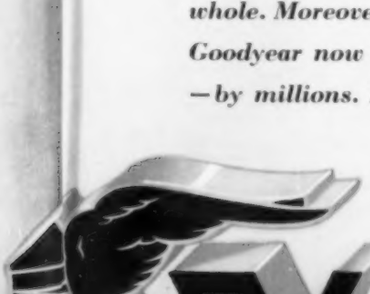
Back of this unremitting search for ways to serve the needs of transportation better has been a steady faith in public judgment: a confident belief that great excellence will find a fitting reward.

P. W. Litchfield
President

GOOD

RESULT

In the last seven years Goodyear's annual production of pneumatic tires for motor vehicles has increased 150%, as against an increase of approximately 52% for the rubber industry as a whole. Moreover, Goodyear has made more tires than any other manufacturer—by millions. Goodyear now is making and selling, annually, more tires than any other manufacturer—by millions. More people ride on Goodyear Tires than on any other kind—by millions.



YEAR

© 1936, by The Goodyear Tire & Rubber Co., Inc.

FOR A DISCRIMINATING CLIENTELE

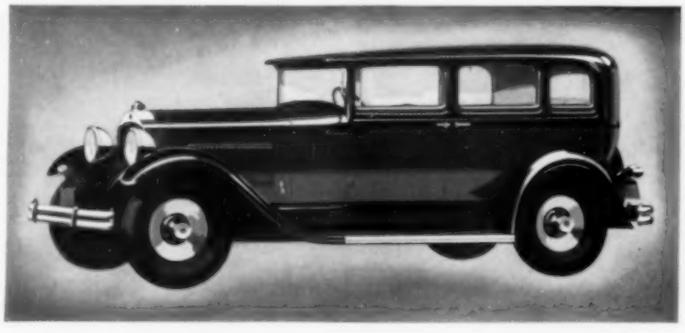
Through all the ages fine things have been produced because there were those who could appreciate their ownership. The celebrated Goya tapestries executed in Spain in the late 18th century, were woven under royal patronage. Today Packard builds fine cars for those who appreciate and are satisfied only with the truly beautiful and luxurious in transportation.

Most popular of all Packard cars is the distinguished and luxurious Standard Eight Five-Passenger Sedan. The Sedan pictured below is of the new 826 series —characteristically Packard in lines and general appearance but embodying added power and beauty, new improvements and refinements in many of its details. It costs no more to own this beautiful and distinctive new Packard than to drive any other car of similar size and power, whatever its price. Operating expenses are little if any less for a car of similar size but lesser excellence and lower price.

And depreciation, the major cost of motoring, totals no more for the Packard —if the owner keeps it a little longer than he has been accustomed to drive other cars. There is nothing unusual in this, for most Packard owners *do* keep their Packards far longer, both in months and miles, than the cars they previously owned. Not for economy's sake —but because they want to keep them! Why not buy a Packard Standard Eight Sedan and provide your family with the beauty, comfort and distinction of luxurious transportation? Any Packard man will chart Packard ownership costs for you side by side with those of your present Packard-size car. You will find, undoubtedly, that you are *paying* for a Packard. Why not *have* one?

PACKARD

ASK THE MAN
WHO OWNS
ONE



Volume 11

Fortune

Number 4

Contents for October 1930

Movies 33
Stars 38
Drug, Inc. 42
Sterling Products 45
Persian Rugs 46
Nitrogen 55
Adamses 64
Match Boxes 68
Silver 70
Chrysler 73
Sulphur 78
World's Fair . . . 84 and 96
Skyscrapers 85
Morgan 98

. . .

Off the Record 6
Statistics 24
Supplement 133

for November

Hawaii . . . . . American Can . . . . . Harem War
Skyscrapers . . . . . Millers . . . . . Virginia . . . . . Stadia
Seals . . . . . Grand Rapids . . . . . Rentschlers

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Courtesy First National Pictures

A SHOT FROM *SONG OF THE FLAME*, PRODUCED BY FIRST NATIONAL, WHICH IS OWNED BY WARNER BROTHERS. THEY TOOK THE LEAD IN COLOR AS THEY DID IN TALKIES

Color and Sound on Film

Classic examples of how Science raises the already enormous gamble of Showmanship—the fastest revolution in industrial history and the stars thereof.

LATE summer advices from Hollywood were that several big producers are thinking of going back to silent films—an idea that has only to be mentioned in order to become ridiculous. A more reasonable proposition is that the musical comedy film is no longer good: but *Whoopee* is one of September's hits. The "Westerns" are to be the big thing this season—or have they already been overdone? Costume stuff has certainly been run ragged, yet costumes always come back. To a business of staggering proportions faced with impenetrable doubt, the Harvard Business School suggests a survey. Possibly a questionnaire might be sent to the inhabitants of First Avenue and Keokuk asking what kind of pictures they would like next spring. Then, when Hollywood is put on a Harvard business basis, the most exciting gamble since fish first tried to live on land will have been eliminated from human affairs.

Compared with the last twenty years' gamble in the film theatre, Monte Carlo is a friendly game of dominoes and Deauville a county fair. Essentially it has been the old game of guessing human emotions practiced by politicians, playwrights, and merchants everywhere and always. But also, in the film theatre the gamble of Showmanship has been complicated by its partnership with Science.

It was by the invention of the motion picture that Science for the first time in the world's history directly affected drama. Before then the only excursions of Science into this ancient and popular art had been represented by trivial developments such as footlights and make-up. But within half a generation after *The Great Train Robbery* (1903) the theatre of photograph-pantomime had completely eclipsed the spoken drama; it had established itself in the lives of all western people to a degree exceeded only by the church of the middle ages; it had produced in Charles Chaplin and Mary Pickford characters of incredible if not indelible fame. The only trouble with Science is that it does not know how or where to stop. It should have let us have at least a century of photograph-pantomime. Instead, we were no sooner beginning to master the technique of this new and universal art than Showmanship saw a way to exploit what Science had had available for several years—the crude elements of photographic *spoken* drama. And now, with the talkie still in its infancy, both technically and artistically, comes the exploitation of color, while from around the corner falls the shadow of Television.

Reflections on a revolution

The talkie revolution having been accomplished (beyond comparison the fastest and most amazing revolution in the whole history of industrial revolutions), the producers say they are glad it happened. Talkies, they say, came just as the popularity of the movies was beginning to wane. Despite the general agreement on this proposition, it remains absolutely unprovable and extremely doubtful. Already—after only two years of talkies and long before they have been perfected—there is another distinct drop in movie attendance. Looking for a reason ("bad times" is inadequate) we find a circumstance which contains one of those strange paradoxes which haunt the showman's career. The talkies, bad though they may be, are *too* good. This is the theory: in the silent days people were kept movie-minded by the few great pictures (Chaplin, Fairbanks, etc.) which appeared every year; but also, and much more importantly, they made a regular habit of going to the movies several times a week; if the picture were fair, they got a thrill: if it were poor, they communed peacefully and beneficially with their cud-like souls. Now the talkie brings them a definitely higher form of entertainment; from a good talkie they get a far greater thrill than from any except the very best silents; but before going to it they want to be sure that the talkie is good; otherwise, they are not thrilled but simply disturbed; in short, the talkie has made the public critical.

Courtesy Warner Bros.
A BILLION-DOLLAR BUSINESS: THE CLIMAX

Nevertheless the talkie has completely nullified the silent screen. This is entirely characteristic of the machine. A new machine (or process) does not merely *add;* it *replaces.* In most lines the replacement is gradual, but in the show business nothing can prevent the replacement from being almost instantaneous. The reasons are obvious. Price, for example, is no object. A public which has tasted talkies cannot be lured to silents by offering the latter at cut-rates. (On the contrary, a conviction that brass pipes or colored porcelains are best for bathrooms does not lead to immediate replumbing.) Now this also results in the fact that in the show business it is quite possible for a relatively unimportant innovation to have consequences almost as serious as a major invention.

Color

An ideal illustration of the weird relation between Science and Showmanship is to be found in the most hotly disputed of current developments: color. The importance of color to drama is as nothing compared with the importance of voice. But, even though it may add little to dramatic interest, it obviously has the possibilities of *replacing* black and white. This replacement threat makes color a deuce in a game wherein all deuces are wild. While the players bet millions pro or con, let us see whether this latest threat can be rationalized from the side lines.

The first surprising detail about color is that it makes Boston a sort of sub-capital of the movie world. It is a better than ten to one bet that every color film you have seen was made in Boston. For the history of colored movies is almost entirely the history of Technicolor, which began in Boston years ago and whose main plant is still there. A new plant in Hollywood went into operation last spring. The hero of Technicolor is Dr. Herbert T. Kalmus.

Forty-nine next month, Dr. Kalmus stands about six foot three. Under brown hair that is fast turning gray, a pair of blue eyes expresses the unusual union of keen business ability with pure scientific excellence. Perhaps as a result of this his suits are always pressed, his words always precise. Conservative in taste, he favors blue, black, and gray color schemes, plays golf, and is absorbed in Technicolor. At the same time, his personality has its lyric side, developed by years at sea as a boy before working his way through M. I. T., where he graduated in 1904. For lyric satisfaction he listens to music, composes on the piano for his own amusement, owns the home of an old sea captain in Centerville, Massachusetts, and eighty acres of wooded land on Cape Cod, where he and Mrs. Kalmus camp and rest. Lovely Mrs. Kalmus with titian hair is in charge of the Technicolor art department and used to pose for early Technicolor experiments in Florida. Thus is the entire family absorbed in the development of this most modern of arts, Dr. Kalmus having started his researches in 1915 and now being both president and general manager of the Technicolor Motion Picture Corporation. In 1912 he was head of the Research Laboratory of Electrochemistry and Metallurgy for the Canadian Government.

Courtesy First National Pictures

ONE THOUSAND DOLLARS PER WORKING HOUR

Studio set used in Marilyn Miller's talkie version of her Broadway hit, *Sunny*. For sets in such a film $40,000 is a probable cost. This picture (by First National) took eight weeks to produce: total cost about $1,000 per working hour.

For fifteen years he has had only one occupation: to make color movies. Ten years ago he produced in the laboratory colored movies as good as or better than any we have seen in the theatres. But the gap from laboratory to theatre was immense. The first real opportunity came in 1922 through the Brothers Schenck; Joseph M. loaned to Technicolor the facilities of the United Artists studio to make *Toll of the Sea*, starring Anna May Wong, and Nicholas M. distributed the picture through Metro-Goldwyn-Mayer. Paid for by Technicolor, this was the first all-color movie except for two sporadic attempts by other methods seventeen years before. M-G-M gave color a further boost by being the first to use it for a few scenes in their own big pictures (*Ben Hur*, *The Merry Widow*). Jesse Lasky of Paramount was the first producer to gamble an extra $100,000 on a all-color movie (*Wanderer of the Wasteland*, 1924), and Douglas Fairbanks followed with *The Black Pirate*. But it was the Warner Brothers who took the first real gamble on color, just as they were the first to gamble in sound. Having scooped the world in 1927 with sound, they undertook a color scoop in 1929 by contracting with Technicolor for no less than forty all-color pictures.

He who has seen a camera which will take color movies has seen a rare sight. There are only about fifty of them in the world—two years ago there were less than ten. Each costs about $4,000 as against several hundred dollars for non-color cameras. The actual photography of a color-movie is done from beginning to end by Technicolor crew—not by a producer's own cameramen. When the picture is taken, the master negative is sent to Boston, where with infinite care and patience the positive prints are made. For this complete photographic service Technicolor is paid about eight cents a foot by the producer, as against about two cents a foot which black and white photography costs the producer. This difference in mere photographic cost would stop anybody but a showman. A black and white feature picture contains about 7,000 feet of film and 200 prints will be required, making 1,400,000 feet in all. At two cents each, that is $28,000. The same picture in color, at eight cents a foot, will cost $112,000. Thus, simply for photography, a color picture raises the gamble by some $84,000. But far more than that is spent in the extra time consumed in making a color

Courtesy Universal Pictures

A SET FROM *KING OF JAZZ* WHICH COST UNIVERSAL $1,650,000 TO PRODUCE

For his performance in this picture, Paul Whiteman is believed to have been paid the largest salary ever known in Hollywood. In addition Universal ran a special train to the West Coast for the thirty-four members of the super Whiteman band. They took their wives. After arrival the theme for the story was changed, and it had to be rewritten. Universal sent the thirty-four members of the band and their dependents back East, in a special train. Later they returned to Hollywood (but not on a private train) to make the picture. Altogether they were on the pay roll nine months. John Murray Anderson was the director, and he knew nothing about the movies except the myth that Hollywood was made of gold. So a good time was had by all but Universal and their troubles were just beginning, because the picture didn't take in New York. However, the provinces have come to the rescue, and now Universal hopes to break even.

picture. Roughly, we may say that the same picture which would cost $750,000 in black and white will cost at least $1,000,000 in color. Let us hasten also to say that except for years of struggle in solving practical production problems, such a color picture would cost nearer $2,000,000 if it could be made at all. Here we must also note that there are many other color processes in competition with Technicolor. But however fine their laboratory product may be, none of them can be taken seriously until it has actually taken a full-length picture under Hollywood conditions and at a price somewhere near eight cents a foot. Paramount is experimenting; Fox has built a plant since abandoned. Howard Hughes has Multicolor, with a plant in Hollywood, while perhaps most advanced of Technicolor rivals is the Colorcraft Corporation, with a new plant on Long Island scheduled to be in production this fall.

Color and Competition

Now the producer is naturally reluctant to add $250,000 to his ante on a special production or $100,000 to his ante on the regular program picture. If there were only one producer in Hollywood, he would probably consign all color processes to the bottom of the sea, because it is scarcely arguable that color will materially increase the total "consumption" of movies. But competition being what it is, the producer must ask himself: will color develop to a point where black and white will fail to produce the illusion it always has produced? And therefore, will color, this season or next, or next, replace black and white? That is the question.

A year ago the answer seemed to be: "Yes —and soon." The talkie revolution had come in 1928 so much faster than anyone could have foreseen that in 1929 all the producers, afraid of being scooped again, followed Warner's lead in making huge non-cancellable part cash in advance contracts for color in 1929-30—nearly all, of course, with Technicolor. And they were, of course, wrong. For two reasons: (1) because, as aforesaid, the importance of color to drama is as nothing compared to the importance of voice; (2) because imperfect color is far more noticeable than imperfect sound (our eyes are many times more sensitive than our ears). For these reasons, color caused practically no sensation (few people realize how many

[*Continued on page 124*]

PAUL WHITEMAN

RICHARD BARTHELMESS

Photos Courtesy Technicolor, Inc.

BEBE DANIELS

LAWRENCE TIBBETT

Pictures on these pages are, with one exception, approximations of color shots from recent movies made in Technicolor. The exception is CLARA ("It") BOW. Although Paramount has recently renewed her contract (on promise of good behavior) and although she has red hair, her charms have not yet been revealed in color movies. However, the red hair of Paramount's NANCY is ably exploited in Follow Thru, due to open September 27.

BEBE DANIELS is the biggest star of RKO, the newcomer among Hollywood producers.

LAWRENCE TIBBETT'S is the best operatic voice yet heard in a full-length cinema. M-G-M's The Rogue Song was a huge hit with little but song and color to commend it.

But color never makes a poor picture good as was proved by RICHARD BARTHELMESS' Son of the Gods, wherein he was a much less exciting Chinaman than in Broken Blossoms, which helped to make him famous years ago.

MARION DAVIES was a great star before the recent mechanical revolution in the movies. In The Florodora Girl she triumphed over new technique—a delightful talking comédienne, garmented (for one sequence) in color.

The ALBERTINA RASCH BALLET was seen again in color in The Rogue Song.

Courtesy Paramount Publix Corporation
CLARA BOW

Courtesy Technicolor, Inc.
NANCY CARROLL

Courtesy Metro-Goldwyn-Mayer
FLORODORA GIRL

Courtesy Metro-Goldwyn-Mayer
ALBERTINA RASCH BALLET

Man and Woman and the Public

For the most part, the old lures are still the best. But not yet have we seen the great talkie star.

IT was not altogether a surprise to producers when they found that the apparent possibility of freeing their business from the star system was an illusion. For one thing the public gave evidence that the sound device, though effective as a novelty and vastly promising as a permanent enrichment of their favorite diversion, was not enough by itself to command gate receipts. Cinema-seers continued to pay down their money in impressive quantities only at the box offices of those theatres on whose firesign they saw the great names they knew and approved. For another thing, the invasion of legitimate stage actors and actresses of Hollywood failed to produce much change in the personnel of the picture business. By degrees the invasion dwindled, then stopped almost totally. A few famous names—notably Vilma Banky, Emil Jannings, and Adolphe Menjou—slipped out of sight, uprooted by the new conditions, but a great proportion of established stars, in spite of all predictions to the contrary, held their places.

Clearly the change that sound had produced in the industry was not the subordination of stars to character actors. Rather it had proved a field for the development of a new and infinitely more important kind of star and for enhancing the value of those already created stars who were able to meet the different conditions. The box office following of the leaders in silent pictures might become insignificant compared to that waiting for actors who, in addition to personal charm and pantomimic ability, could make their voices salable. Already the potency of voice alone as a mechanic for creating reputation had been proved by radio. Picture-makers understood the significance to their own business of the crowds who stormed the personal appearances of radio's arch-interpreter of sentiment, Hubert Prior Vallée. They saw a new meaning in the nation's response to a pair of unexceptional vaudevillists who successfully introduced an aural blackface comic strip. For the radio business to have national stars proved that the public could literally be taken by the ears. It suggested that the great dramatic actors and singers of the talking picture may create in a world audience an idolatry equal to that which the dramatic actors and singers of past decades exerted on isolated capitol cities.

To date no star has arisen as the first of the talking picture's giant aristocracy. Instead, a limited group of able players have entrenched themselves safely in various specialized and individual methods of appeal. First, the females:

Passion, mysterious, provocative, combined with high-powered individual fascination . . .

GRETA GARBO

Critics predicted that her Swedish accent would make her useless before the microphone. Instead, her first talkie, *Anna Christie*, in which the accent was essential to the character, has been a box office smash and a general selection as the best talkie released in the first six months of 1930. Besides being her first talkie, it was the first picture in which Metro-Goldwyn-Mayer had ventured to project her allure without its usual decorative support, in threadbare clothes, against a background unchangingly sordid. *Romance*, her second microphonic effort, her deep, slow voice, impelling in its monotony, made negligible even the absurdity of her being cast as an Italian soprano. Such is the force of her charm and the addiction of her following that even before her voice was recorded, the silent pictures she made continued to compete successfully with the talkies made by other stars. Termination of her romance with John Gilbert did not interfere with the steady growth of her popularity, and the mystery surrounding her personal life has been increased by the fact that she lives in retirement in Hollywood, avoids *première* performances, and goes to see her own pictures when they are shown at little suburban theatres, wearing dark glasses, a polo coat, and a man's hat.

Sex, in the most satisfactory form familiar to the average U. S. male . . .

CLARA BOW

Recently the irresponsibility she portrays so well in character and which is her dominant personal trait involved her in predicaments bad for her box office draw. Further naughtiness might chill a public intolerant of caprice in its idols, but Clara Bow's hold on the U. S. imagination is strong. Daughter of a day laborer in Brooklyn, New York, she first came to attention when a dollar photograph of her won first prize in a national beauty contest. Like her face, her stimulating figure is a synthesis of U. S. standards. Her pictures are brightly colored, quick-moving, and vapid, titled with a suggestion of daring seldom borne out by the context. Some critics have professed that with training she might become an actress; Paramount shrewdly seems to feel that she is most effective in the unpolished state—quintessence of a national type.

Romance, virginal innocence, as inspiration for tender parables of first love . . .

JANET GAYNOR

Her delicacy never has to be accentuated by more than nominal make-up as she is naturally frail and in her adolescence suffered from ill-health. In her best pictures she played with wonderful success romantic parts in which there was a strong coloring of character (*Four Devils*, *Christina*, *Lucky Star*). Since it was hard to find vehicles that fitted the formula, Fox launched her into librettos that put an emphasis on music and dancing, and though totally unproven in these activities, she increased her draw so definitely that Seymour Felix at the Fox lot ordered all other players under contract to the company to appear before him for inspection of their abilities as dancers. In spite of the success of *Sunny Side Up*, it is patent that she lacks the vitality indispensable to musical comedy, even of the most saccharine kind. Recognizing this, she quarrelled with Fox to the extent of quitting work until they promised her a greater proportion of dramatic rôles.

Aristocratic beauty, poise, and intelligence, functioning in backgrounds of the best society . . .

NORMA SHEARER

In her débutante year in Montreal she was pointed out as the girl with whom the Prince of Wales danced three times at a party given for him during one of his visits there. She went into show business because soon after the evening of her elevation as a royal dancing partner her family lost most of its money. Before sound was invented, her presence, good looks, and ability as an actress had made her an important star; with the added instrument of her cultivated and flexible voice, the impact of her personality and hence her value to Metro-Goldwyn-Mayer was vastly increased. After she had achieved her own success independently, she married Irving Thalberg, Metro-Goldwyn-Mayer executive. Because almost all the best drawing-room plays in the traditional line of English drama from Sheridan to Somerset Maugham are perfect vehicles for her, she is likely to remain one of the most important women in the contemporary cinema.

Womanhood, as revealed in the operation of character usually including but never dependent on some chosen angle of sex appeal . . .

RUTH CHATTERTON

She is the only actress recruited for the talkies from the legitimate stage who has

M-G-M

(*Metro-Goldwyn-Mayer*)

ON THIS AND FOLLOWING pages certain outstanding talkie successes are grouped under the names of the producers with which they are associated.

GRETA GARBO
(*Romance*)

JOAN CRAWFORD
(*Our Blushing Brides*)

Photos Courtesy Metro-Goldwyn-Mayer
WILLIAM HAINES
(*Way Out West*)

NORMA SHEARER
(*Let Us Be Gay*)

RAMON NOVARRO
(*Call of the Flesh*)

FOX

FOX IS THE SIMPLE NAME for the biggest corporate aggregation in the cinema business. By controlling Loew's, it controls M-G-M and thus, although M-G-M is managed entirely separately from Fox, all the stars on this page are in one sense Fox stars.

Photos Courtesy Fox Productions
CHARLES FARRELL
(*High Society Blues*)

JANET GAYNOR
(*High Society Blues*)

WARNER BROTHERS FIRST NATIONAL

GEORGE ARLISS
(*Old English*)

JOHN BARRYMORE
(*Moby Dick*)

Photos Courtesy Warner Bros.
CONRAD NAGEL
(*The Sacred Flame*)

LILA LEE
(*The Unholy Three*)

RADIO PICTURES

Photos Courtesy Radio Pictures
RICHARD DIX
(*Shooting Straight*)

BETTY COMPSON
(*Inside the Lines*)

won a place in the cinema's top flight. She justified Emil Jannings' early recognition of her genius by acquiring a huge public almost overnight. Although she lacks the conventional beauty always heretofore considered necessary for a picture actress playing straight rôles, she created some of the first authentic dramatic hits of talking pictures (*The Doctor's Secret, Madame X*). With experience, she has learned the tricks of posture and facial angle that stars use to make the camera kind to them, so that in her later productions she has even appeared to have the beauty she was thought to lack before. The talkies' most consummately skilled emotional actress, her name means capacity at almost any theatre.

Extreme modernity, the daring youth of a generation given to experiments in conviviality . . .

JOAN CRAWFORD

She was merely one of Hollywood's many pretty and promising new stars until a moment in *Our Dancing Daughters* when, surrounded by extras in tuxedos and evening gowns standing in a circle on a ballroom floor, she propelled her notably shapely person through a solo dance that made the picture famous, that seemed the culmination of its mood and of the mood of many similar pictures. Although she is not particularly effective vocally, the allure of her figure and animation will undoubtedly keep her place safe as interpretress of those typically cinematic, "party" stories that have become her vogue.

Gayety, combined with a romantic appeal made enormously more effective, and sometimes actually created, by an atmosphere in which nothing is to be taken seriously . . .

MARION DAVIES

Her imitations of film celebrities, improvised at parties in Beverly Hills, had given her a private reputation as the screen's cleverest *comédienne* long before she had proved it in front of the camera. Adding vocal possibilities to her talents as a mimic, the talkies opened a new variety of stunts for her and proportionately increased her popularity (see Florodora picture on page 37).

. . .

Besides these top flight stars, there are numerous other actresses whose names in lights are a fair guarantee of acceptable entertainment. These can be included in two groups: (1) veterans of silent pictures who are earning big salaries today for their unimpaired ability to turn out good program features: Bebe Daniels (RKO), Lila Lee (Warner Brothers), Betty Compson (RKO), Dolores Del Rio (United Artists), and Billie Dove (First National); (2) young stars or featured players coming into fame, but still not yet secure enough in success to be appraised at their true worth to the

industry: Claudette Colbert (Paramount), Kay Johnson (Metro-Goldwyn-Mayer), Leila Hyams (Metro-Goldwyn-Mayer), Constance Bennett (Warner Brothers), Alice White (First National), Nancy Carroll (Paramount), Helen Twelvetrees (Pathé), Kay Francis (Paramount).

THE MALE

Can be defined in the same terms.

As market factors, the relative appeal of the outstanding males may be tabulated in terms roughly corresponding to those that define their female competitors.

Chivalry, cultivated, and suave but implying an infinite capacity for ardor . . .

RONALD COLMAN

Undoubtedly the most important male star in pictures, he has built his extraordinary prestige with apparently very ordinary equipment. Handsome, but less striking than many screen men, slender, poised, restrained, he is a polished histrionic workman. Critics called his *Bulldog Drummond* the finest crook picture ever made; it was also the finest piece of directorial craftsmanship the talkies had produced up to the time of its release. His personal opinions on general cinema theory as applied to management and the future of the industry are shrewder and more definite than those of any other actor except Douglas Fairbanks Sr. Like Garbo, he participates little in Hollywood life except among the British clique; he is regarded as opinionated, cocksure, and slightly peculiar. His future looms as a more important factor for United Artists than the brilliant past of such celebrated co-workers as Mary Pickford, Douglas Fairbanks, Lillian Gish, Gloria Swanson, Norma Talmadge, and Charles Chaplin.

Charm, strictly cosmopolitan . . .

MAURICE CHEVALIER

With an unprecedented sunburst of publicity, Paramount surmounted the difficult task of making the U. S. curious about a name which, before *Innocents of Paris*, was totally unknown except to the non-picture-going cosmopolites who had heard him sing in Paris cabarets. In *The Love Parade*, he was starred in a kind of entertainment entirely new and properly indigenous to the talking cinema—part musical comedy, part sophisticated romance, against superb photographic backgrounds. A slightly less successful variation of this formula was repeated in his last release, *The Big Pond*. Since no vehicle will be satisfactory for him that makes it necessary to assume any character other than his own, he is now, and will doubtless remain, the cinema's outstanding revue headliner.

[*Continued on page 122*]

PARAMOUNT

RUTH CHATTERTON
(*Anybody's Woman*)

MAURICE CHEVALIER
(*The Big Pond*)

WALTER HUSTON
(*Lincoln*)

JACK OAKIE
(*Let's Go Native*)

Photos Courtesy Paramount Pictures
GEORGE BANCROFT
(*Ladies Love Brutes*)

CLAUDETTE COLBERT
(*Manslaughter*)

The World's Biggest Drug Chain

Is only one stone in the brilliantly planned structure of Drug, Inc. Herein is told how a share of Drug, Inc. common came to give its owner better service than he had formerly enjoyed.

DRUG, INC. owns the largest chain drug store system in the world, and every one of you has at one time or another walked into one of its stores. Drug, Inc., being exclusively a holding company, does not advertise, but of the companies it holds you have heard of Life Savers, Inc., the Bayer Co. (aspirin), the Vick Chemical Co. (VapoRub), Bristol-Myers Co. (Ipana, Sal Hepatica). Of drug stores which it includes, you have heard of Rexall stores and Liggett stores, Owl stores on the Pacific Coast and Boots stores in England. You may not know that, on August 1, 1930, conservative Kidder, Peabody & Co. estimated that its current earnings were running at a rate in excess of $6.00 a share per annum and its sales at $160,000,000, a figure which is probably low. (Its net for the first six months of this year was $10,542,007, up $3,000,000 from the same period last year.)

Drug, Inc. is a money-maker now, it is far from through with its expansion program, and it is a good company to watch. It is also a good company to understand, because it straddles a number of fields at once, is as important a manufacturer as it is a retailer, as important a retailer as it is a distributor, and never confuses the three functions. Thus, when it bought the May Drug Co.'s eighteen Pittsburgh stores in December, 1928, it was following quite another tack than when it bought Life Savers, Inc. just one month later. And in the difference lies the key to the development of Drug, Inc. since it officially came into being on March 2, 1928.

A glance at the chart on the opposite page reveals the fact that from the corporate body of Drug, Inc. there extend two arms, quite properly terminating in two hands, each of which has many fingers. Now it would be straining the metaphor to say that Drug, Inc. does not let its right hand know what its left hand is doing, but it is true that Drug, Inc. is distinctly ambidextrous and that one hand is as important as the other. So far as the body itself is concerned, it contents itself with taking in the financial nourishment gathered by each of its busy hands, seeing to it that they gather more together than they could separately, and distributing the proceeds to the 22,000 stockholders whose corporate creature it is.

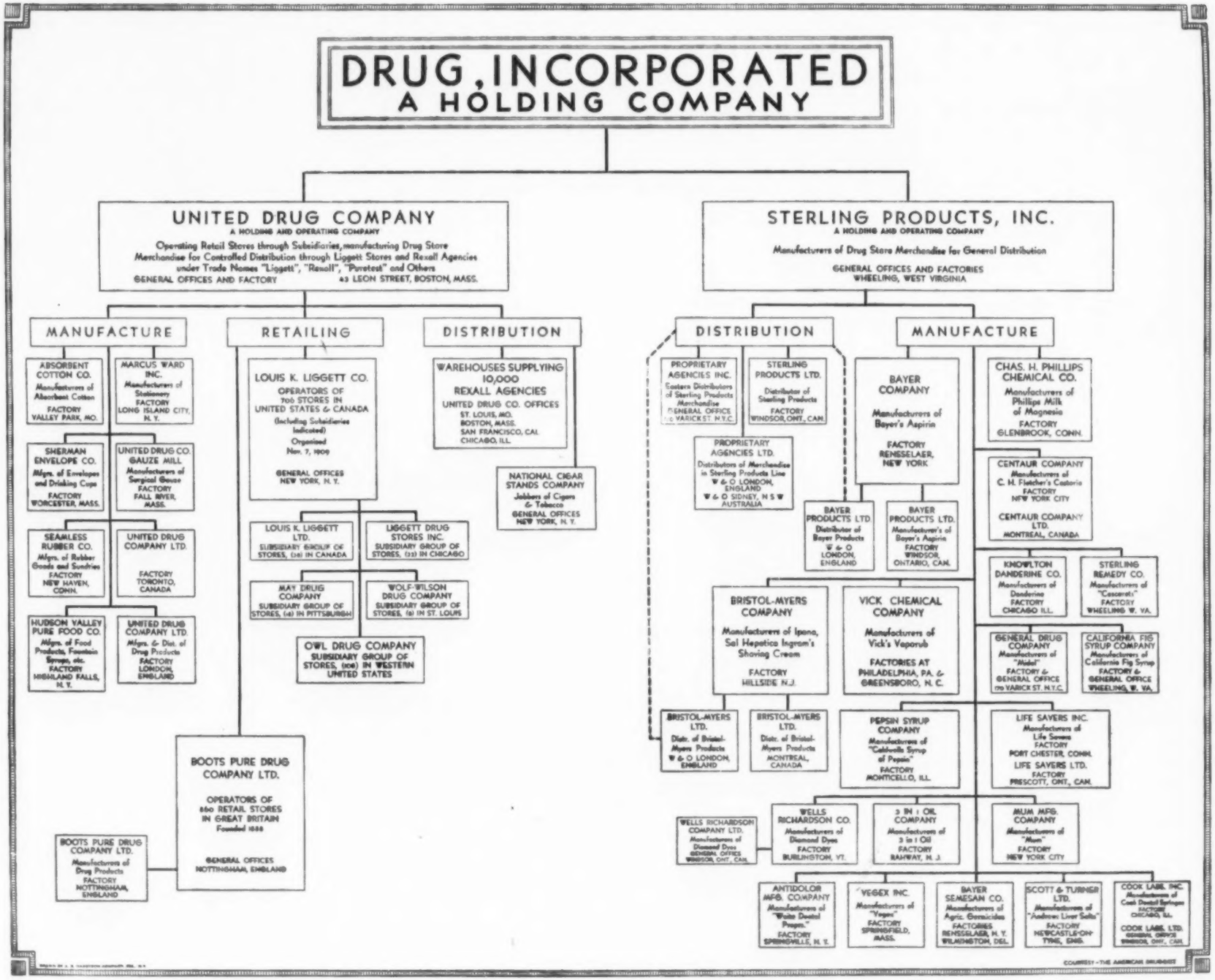
Left hand—United Drug

The United Drug Co. was originally a red building in a street called Leon in Boston. Candy was made in the basement and on the top floor, and sandwiched in between the candy-making floors were three floors devoted to drugs and a few executive offices. Forty druggists, including Mr. Louis K. Liggett of Boston, each put up $4,000 to form it, and they didn't quite know what was going to happen to it or to their money. In fact, several of them could not even find Leon Street, and Mr. Liggett issued to each of them a printed direction slip saying that the best way to find the factory was to get off at Back Bay Station, walk to a corner, grab a cow by the tail, let her lead you to the city limits, and then somebody would probably show you the way. It was all very silly and gay-making, and it was in 1902 and it might never have succeeded and Mr. Liggett might never have had a yacht. But it did succeed, and it is now the 10,000 Rexall stores, the 706 Liggett stores, the 860 Boots stores, and the many factories of United Drug and its subsidiaries. And it is as shrewd a system of distributing and retailing as that of the Great Atlantic & Pacific Tea Co. The early history of the company, its modest beginning, and gradual acquisition are interesting but usual. You may take it for granted that United Drug was once a little red building and that it had a tough time at first. It is of more moment to tell you what it is than what it was.

Of more moment, that is, except for one thing. That is an idea which is past history because it occurred in 1901, but is current history because it operates today. In 1900, Mr. Liggett, not very successfully, was selling drugs and medicines in what salesmen call the Boston area. He saw about him many patent medicines, each popular in its own little district. Why not, asked Mr. Liggett, pool all these special formulas, invest in a central manufacturing business (the original building in Leon Street), and thus allow each druggist to have a wider line of popular medicines? Each druggist would be the exclusive retailer of the jointly manufactured products in his own district. Upon this idea was built United Drug, now one of the two hands of the great Drug, Inc. The little manufacturing business in Leon Street is now the large manufacturing business in Leon Street and factories of subsidiaries from London to Valley Park, Missouri. The forty original Rexall (king of them all) agents have swollen to 10,000, managing 10,000 Rexall stores, and there has developed a branch of United Drug which was not foreseen in 1902. The Liggett chain began with the purchase of a Rexall store upon the death or retirement of the agent. Now it includes 706 stores, almost entirely in the large cities.

The relationships between these three major parts of United Drug (the factories, the Liggett chain, and the Rexall agents) are important to an understanding of Drug, Inc. and the difference between the purchase of the May stores and of Life Savers. United Drug, in 1927, made some 9,000 separate items of merchandise, many of them branded with the trade names of Rexall, Puretest, Liggett, etc. These included tooth pastes, some five different kinds of mouth wash, candy, shaving soaps and creams, aspirin, laxatives, bicarbonate of soda—all the staples of a drug store as well as bathing caps, hot water bottles, and the various paraphernalia of the new drug store era. They were available to the Liggett chain and the Rexall agents only, and they automatically provided these retailers with a line of highest quality merchandise on which no competition could undersell because no competitor possessed them. For both the chain and the agents, the exclusive agreement was ideal. As ruinous price-cutting (of which more later) became universal, the Liggett and Rexall managers could rely upon their renewal trade in United Drug products at a maintained price. Some small town Rexall agents bought as much as 40 per cent of their entire merchandise requirements from United Drug; the average of both Liggett and Rexall chains itself was nearly 20 per cent. The plan was as successful when United Drug was a huge company with a $7,000,000 profit as it had been in the early Leon Street days.

And from the manufacturing end, the exclusive agreements had many merits. There were provided some 11,000 assured outlets. A relatively small sales staff (about 100) would bring selling costs down to the extremely low figure of 4.7 per cent of the sales price. There was also an advantage in being able to gauge the demand so exactly, particularly in a company where 9,000 products had to be kept in balance and evenly distributed over the year. But from one important point of view, the exclusive agreement applied a definite brake to United Drug progress. So long as the agreement remained in force, it was out of the question


DRUG, INCORPORATED
A HOLDING COMPANY
UNITED DRUG COMPANY
A HOLDING AND OPERATING COMPANY
Operating Retail Stores through Subsidiaries, manufacturing Drug Store Merchandise for Controlled Distribution through Liggett Stores and Rexall Agencies under Trade Names "Liggett", "Rexall", "Puretest" and Others
GENERAL OFFICES AND FACTORY 43 LEON STREET, BOSTON, MASS.
MANUFACTURE
RETAILING
DISTRIBUTION
ABSORBENT COTTON CO.
Manufacturers of Absorbent Cotton
FACTORY VALLEY PARK, MO.
MARCUS WARD INC.
Manufacturers of Stationery
FACTORY LONG ISLAND CITY, N. Y.
SHERMAN ENVELOPE CO.
Mfgrs. of Envelopes and Drinking Cups
FACTORY WORCESTER, MASS.
UNITED DRUG CO. GAUZE MILL
Manufacturers of Surgical Gauze
FACTORY FALL RIVER, MASS.
SEAMLESS RUBBER CO.
Mfgrs. of Rubber Goods and Sundries
FACTORY NEW HAVEN, CONN.
UNITED DRUG COMPANY LTD.
FACTORY TORONTO, CANADA
HUDSON VALLEY PURE FOOD CO.
Mfgrs. of Food Products, Fountain Syrups, etc.
FACTORY HIGHLAND FALLS, N. Y.
UNITED DRUG COMPANY LTD.
Mfgrs. & Dist. of Drug Products
FACTORY LONDON, ENGLAND
LOUIS K. LIGGETT CO.
OPERATORS OF 706 STORES IN UNITED STATES & CANADA
(Including Subsidiaries Indicated)
Organized Nov. 7, 1909
GENERAL OFFICES NEW YORK, N. Y.
LOUIS K. LIGGETT LTD.
SUBSIDIARY GROUP OF STORES, (26) IN CANADA
LIGGETT DRUG STORES INC.
SUBSIDIARY GROUP OF STORES, (22) IN CHICAGO
MAY DRUG COMPANY
SUBSIDIARY GROUP OF STORES, (16) IN PITTSBURGH
WOLF-WILSON DRUG COMPANY
SUBSIDIARY GROUP OF STORES, (6) IN ST. LOUIS
OWL DRUG COMPANY
SUBSIDIARY GROUP OF STORES, (108) IN WESTERN UNITED STATES
WAREHOUSES SUPPLYING 10,000 REXALL AGENCIES
UNITED DRUG CO. OFFICES
ST. LOUIS, MO.
BOSTON, MASS.
SAN FRANCISCO, CAL.
CHICAGO, ILL.
NATIONAL CIGAR STANDS COMPANY
Jobbers of Cigars & Tobacco
GENERAL OFFICES NEW YORK, N. Y.
BOOTS PURE DRUG COMPANY LTD.
Manufacturers of Drug Products
FACTORY NOTTINGHAM, ENGLAND
BOOTS PURE DRUG COMPANY LTD.
OPERATORS OF 660 RETAIL STORES IN GREAT BRITAIN
Founded 1888
GENERAL OFFICES NOTTINGHAM, ENGLAND
STERLING PRODUCTS, INC.
A HOLDING AND OPERATING COMPANY
Manufacturers of Drug Store Merchandise for General Distribution
GENERAL OFFICES AND FACTORIES WHEELING, WEST VIRGINIA
DISTRIBUTION
MANUFACTURE
PROPRIETARY AGENCIES INC.
Eastern Distributors of Sterling Products Merchandise
GENERAL OFFICE 170 VARICK ST. N.Y.C.
STERLING PRODUCTS LTD.
Distributor of Sterling Products
FACTORY WINDSOR, ONT., CAN.
PROPRIETARY AGENCIES LTD.
Distributors of Merchandise in Sterling Products Line
W & O LONDON, ENGLAND
W & O SIDNEY, N S W AUSTRALIA
BAYER COMPANY
Manufacturers of Bayer's Aspirin
FACTORY RENSSELAER, NEW YORK
BAYER PRODUCTS LTD.
Distributor of Bayer Products
W & O LONDON, ENGLAND
BAYER PRODUCTS LTD.
Manufacturer's of Bayer's Aspirin
FACTORY WINDSOR, ONTARIO, CAN.
CHAS. H. PHILLIPS CHEMICAL CO.
Manufacturers of Phillips Milk of Magnesia
FACTORY GLENBROOK, CONN.
CENTAUR COMPANY
Manufacturers of C. H. Fletcher's Castoria
FACTORY NEW YORK CITY
CENTAUR COMPANY LTD.
MONTREAL, CANADA
KNOWLTON DANDERINE CO.
Manufacturers of Danderine
FACTORY CHICAGO ILL.
STERLING REMEDY CO.
Manufacturers of "Cascarets"
FACTORY WHEELING W. VA.
BRISTOL-MYERS COMPANY
Manufacturers of Ipana, Sal Hepatica Ingram's Shaving Cream
FACTORY HILLSIDE N.J.
VICK CHEMICAL COMPANY
Manufacturers of Vick's Vaporub
FACTORIES AT PHILADELPHIA, PA. & GREENSBORO, N. C.
GENERAL DRUG COMPANY
Manufacturers of "Model"
FACTORY & GENERAL OFFICE 170 VARICK ST. N.Y.C.
CALIFORNIA FIG SYRUP COMPANY
Manufacturers of California Fig Syrup
FACTORY & GENERAL OFFICE WHEELING, W. VA.
BRISTOL-MYERS LTD.
Distr. of Bristol-Myers Products
W & O LONDON, ENGLAND
BRISTOL-MYERS LTD.
Distr. of Bristol-Myers Products
MONTREAL, CANADA
PEPSIN SYRUP COMPANY
Manufacturers of "Caldwell's Syrup of Pepsin"
FACTORY MONTICELLO, ILL.
LIFE SAVERS INC.
Manufacturers of Life Savers
FACTORY PORT CHESTER, CONN.
LIFE SAVERS LTD.
FACTORY PRESCOTT, ONT., CAN.
WELLS RICHARDSON COMPANY LTD.
Manufacturers of Diamond Dyes
CANADIAN OFFICES WINDSOR, ONT., CAN.
WELLS RICHARDSON CO.
Manufacturers of Diamond Dyes
FACTORY BURLINGTON, VT.
3 IN 1 OIL COMPANY
Manufacturers of 3 in 1 Oil
FACTORY RAHWAY, N. J.
MUM MFG. COMPANY
Manufacturers of "Mum"
FACTORY NEW YORK CITY
ANTIDOLOR MFG. COMPANY
Manufacturers of "Bisma Doubol Preps."
FACTORY SPRINGVILLE, N. Y.
VEGEX INC.
Manufacturers of "Vegex"
FACTORY SPRINGFIELD, MASS.
BAYER SEMESAN CO.
Manufacturers of Agric. Germicides
FACTORIES RENSSELAER, N. Y. WILMINGTON, DEL.
SCOTT & TURNER LTD.
Manufacturers of "Andrews Liver Salts"
FACTORY NEWCASTLE-ON-TYNE, ENG.
COOK LABS. INC.
Manufacturers of Cook Dental Syringes
FACTORY CHICAGO, ILL.
COOK LABS. LTD.
CANADIAN OFFICE WINDSOR, ONT., CAN.
COURTESY - THE AMERICAN DRUGGIST

for United Drug to buy any major nationally branded and advertised product. It would be patently absurd to confine the marketing of Life Savers or Castoria or Cascarets to the Liggett-Rexall systems. Expansion at the manufacturing head of the system was sharply limited, if not altogether stopped, by the very plan which had built it. This was the situation in which United Drug found itself at the end of 1927.

Right hand—Sterling Products

While United Drug was developing along its highly individual lines, another and quite dissimilar company was also making its impression on the drug trade. Sterling Products, Inc. began life in 1901, at about the time when Mr. Liggett was gathering his forty Rexall agents. The retail idea, which was so vital to the United Drug scheme of things, was never stressed by Sterling. In 1906, it took over the first of the long list of patented products which were to come under its management. After Danderine (1906) came Cascarets (1909), California Fig Syrup (1912), and, in 1919, the famous Bayer's Aspirin. As it absorbed each new company, it threw in such management as was needed (often Sterling retains the old management practically intact) and steadily increased the company's profits. In 1925 Sterling earned $4,903,000; in 1926, this mounted to $5,406,000; and in 1927, it jumped again to $6,197,000. United Drug in the same year suffered a slight setback from the peak year 1926 and showed $6,763,-254 before preferred dividends. The two companies were at that point approximately equal in earning power, although United Drug's volume was immensely greater than Sterling's.

Just who was responsible for the idea of the merger is one of the points which is lost in the general Drug, Inc. enthusiasm. It was either Mr. George M. Gales of United Drug or Mr. A. H. Diebold of Sterling or both. The two men were friends and men of imagination, and they were forever tossing up conversational balloons. This one took the air and for excellent reasons.

Each company was impressed by the economies possible through a joint purchasing program. As sixty-five cents of Liggett Co.'s dollar still goes to the supplier, it is apparent that this was no mere talking point. If United Drug and Sterling today could cut even 1 per cent from their joint bills, Drug, Inc. would have another $1,000,000 available for dividends.

This was a major and compelling factor, appealing strongly to both Mr. Gales and Mr. Diebold. On the other hand, each man, each company, had strong individual reasons for favoring the merger. The Sterling firm, for example, spent large sums of money advertising and marketing its proprietary remedies; United Drug could offer about one-sixth of all the 60,000 drug stores in the U. S. as promotional aids. It was indirect promotion, to be sure, for it was obviously impossible to bring the Sterling products into the exclusive agreement. Yet the Liggett stores and the Rexall agents could be counted upon to give them something more than an even break in display and local advertising.

On United Drug's side, the merger offered a brilliant way out of its manufacturing *impasse*. While it could not *itself* buy Bristol-Myers (Ipana, Sal Hepatica, Ingram's Shaving Cream, etc.) and enjoy a $1,600,000 profit on $6,100,000 sales (a ratio of over 25 per cent), there was no reason why the new Drug, Inc. should not reap the large manufacturing profits which were automatically denied United Drug. Provided always that the United Drug system, including the exclusive agreement, remained intact.

There was, finally, the factor of security values. Drug, Inc., the result of the merger, would be not only much larger but would present a far more complete industrial picture than either United Drug or Sterling. It seemed reasonable to suppose the public would give its stock a higher value (in relation to earnings) than it would give to either a manufacturer or to a retailer and distributor whose manufactured products had a closed market. If this happened, Drug, Inc. could obviously continue both United Drug and Sterling expansions more cheaply than either could continue separately. To each company, in short, the merger seemed to open up an attractive future.

Underwood & Underwood
Mr. Louis K. Liggett was responsible for the Rexall idea.

Handshake

At the end of two and one-half years, neither Mr. Gales nor Mr. Diebold nor anyone else in Drug, Inc. sees any cause for regret. Some of their plans have turned out even better than they could have foreseen. After the break, for example, and through the early months of 1930, the assured Liggett-Rexall market was of the greatest value to the various Sterling companies, and such a product as Life Savers shows an actual 1930 gain. Expansion has of course been tremendous. In these two years, United Drug has absorbed three chains (134 stores), and Sterling has added close to a dozen brands known and sold throughout the U.S. Since the merger was effected, Drug, Inc. has used 156,500 shares to acquire retail businesses under United Drug management with estimated earnings of some $750,000 ($4.80 per share), while it has used 1,189,009 shares to acquire manufacturing earnings under Sterling management of some $8,-500,000 ($7.25 per share). This disparity is largely due to the fact that in taking over the Owl chain with sales of nearly $20,000,000, Drug, Inc. was buying sales volume rather than earnings, since Owl's preferred dividends were not being covered in full at the time that it was taken over.

One more notable result of the merger can be seen in the diversification of income which alone makes a share of Drug, Inc. such a radically different investment from a share of the old United Drug or of Sterling. Before the merger, a large part of United Drug's $4,500,000 net for common came from its retail business and followed the general retail rule of an extremely low ratio to sales (the A. & P. ratio, for example, is about 2.5 per cent on the dollar). Sterling's situation with large manufacturing companies enjoying open markets was altogether opposite. Their combination in Drug, Inc. provided a most happy diversification. Of Drug, Inc.'s estimated $175,000,000 domestic sales of the companies now consolidated (1929), Sterling accounts for perhaps $45,000,000. But of Drug, Inc.'s probable $21,000,000 net for this year ($10,542,006.66 for the first six months), Sterling will contribute some $15,000,000 as against United Drug's $6,000,-000 (based upon the last available earning statements and estimates of the respective companies prior to consolidation); and Sterling management has become responsible for dividends of $9,230,000 on 2,307,499 shares against United Drug's responsibility for $4,776,000 on 1,194,000 shares.

Management

However sound the economic urges toward the United Drug-Sterling merger may have

[*Continued on page 110*]

Drug, Inc.: *Sterling Products*

Clinical notes on some famous remedies.

IN PORT CHESTER, Connecticut, are made Life Savers in a factory that you can see from the railroad tracks, and many a commuter to New York has cast an early morning eye at the three huge packs of Life Savers advertising the "Candy Mint With the Hole" on the lawn in front of the building. In Rahway, New Jersey, is the factory for Three-in-One Oil, first concocted by one J. Noah H. Slee, second husband of Margaret (birth-control) Sanger, who is his second wife. It derives its name from the fact that it is actually three oils—animal, vegetable, and mineral.

. . .

The origin of most of the Sterling medicines is pretty much the same. These medicines were made by local doctors, prescribed for their patients. They began to grow in popularity; they became known; they were purchased by Sterling Products; they became nationally known. In Glenbrook, Connecticut, where one Dr. Phillips first made it and sold it to his neighbors, is concocted the now famed Phillips Milk of Magnesia. California Syrup of Figs was first bottled by a man named Queen who lived in Reno, Nevada. There is Charles H. Fletcher's Castoria, a pleasant substitute for castor oil, marketed under the excellent but improbable slogan: "Children Cry for It." One Seraph Deal still enjoys royalties from the sale of Mum. Last year the company purchased the Bristol-Myers Co., manufacturers of Sal Hepatica, Ingram's Shaving Cream, and Ipana Toothpaste. This year it purchased the Vick Chemical Co. (VapoRub.)

. . .

The effect of such companies as United Drug and Sterling upon patent medicines has been, according to the American Medical Association, which is always very doleful upon the subject, to "help toward making patent medicine advertising a little more decent and conservative." With some acidity, the A. M. A.'s Bureau of Investigation concludes that "most of these coöperative concerns make at least a pretense of giving some information regarding the composition of their products."

All the United Drug and Sterling labels, however, are acceptable under the restrictions of the Federal Food and Drug Act. In the history of United Drug, the A. M. A has record of only one product which was declared misbranded. This was a Rexall Headache Wafer marketed around 1910 and declared harmless, although it contained acetphenetidin, a harmful drug. Acetphenetidin is one of the few drugs that the Food and Drug Act requires to be declared as to presence and quantity in patent medicines. The highly ethical and strict A. M. A. could not, of course, approve of any company which markets a patent medicine. But as far as this phase of its business is concerned, Drug, Inc. receives from the A. M. A. as much approval as it could possibly obtain.

Sterling Products, Inc. is itself successor to Sterling Remedies, started in 1887 by one H. L. Kramer of Attica, Indiana. Mr. Kramer in his day was a violent anti-nicotinist and developed a product called No-Tobac. In the spirit of the well-known Keeley cure, No-Tobac tasted so awful that you were supposed never to want to smoke again. The trouble was that No-Tobac was constipating. It rid you of a habit but, with something akin to poetic justice, it created an unpleasant condition. So Mr. Kramer ingeniously developed a laxative pill made of cascara sagrada to be taken after No-Tobac. His trade name was Cascarets. The Cascarets, not the No-Tobac, made the fortune. A moral may probably be drawn.

. . .

Most widely sold drug in the U. S. is aspirin. In Rensselaer, New York, a rather disagreeable town, is the Bayer Co., manufacturers of Bayer's Aspirin, most widely sold and advertised aspirin in the world. The Bayer Co. was originally owned by the I. G. Farbenindustrie, but was seized by the U. S. Alien Property Custodian (at that time the vigorous, brilliant Germanophobe, Mr. Francis P. Garvan) at the beginning of the War. Sterling bought the company from the government in 1919.

. . .

Not listed on the *American Druggist* chart, although they are Sterling companies, are the Winthrop Chemical Company and the Metz Laboratories. They are engaged chiefly in medicinal research and produce no patent medicines. They are the aristocrats of the group. They were omitted because the A. M. A. frowns dourly on the advertisement —direct or indirect—of ethical preparations. The two companies produce nothing which the A. M. A. does not approve though there was once a slight argument about the labeling of a certain product with a trade name.

The Metz Laboratories operate on a smaller scale as do the pharmaceutical laboratories of Squibb or Parke, Davis. They work out new formulas or improve old ones. They are proudest of their discovery of spinocain—an anæsthetic for major operations. It is put into the spinal fluid and causes temporary paralysis of the lower half of the body. It is used on patients whose hearts might not be able to stand ether, and its after effects are less annoying.

The Winthrop Chemical Company is allied with Germany's vast and important chemical company, I. G. Farbenindustrie. It manufactures I. G. pharmaceuticals under a perpetual contract to give I. G. a percentage of the profits.

. . .

Significant among I. G. products are chaulmestral, the leprosy medicine, and luminal, only known specific for epilepsy. Recently developed is an anæsthetic called avertin, rapidly growing in popularity among advanced hospitals. It enables the patient to sleep for some time before the operation and for several hours after it. Its after effects are practically negligible. Vigantol is an I. G. specific for rickets. It was developed by Dr. Windaus, winner of the 1928 Nobel price for chemistry, who at the request of I. G. went to Norway to discover what in cod liver oil made it healthy. He studied the cod's food and found no clue, at length studied the light as it filtered through the water to the cod. He succeeded in isolating Vitamin D. And cod liver oil is properly called bottled sunshine. Vigantol, which is isolated Vitamin D, will cure any case of rickets.

In the whole history of medicine only a very few absolute specifics have been found. One is quinine for malaria; another, I. G.

[*Continued on page 112*]

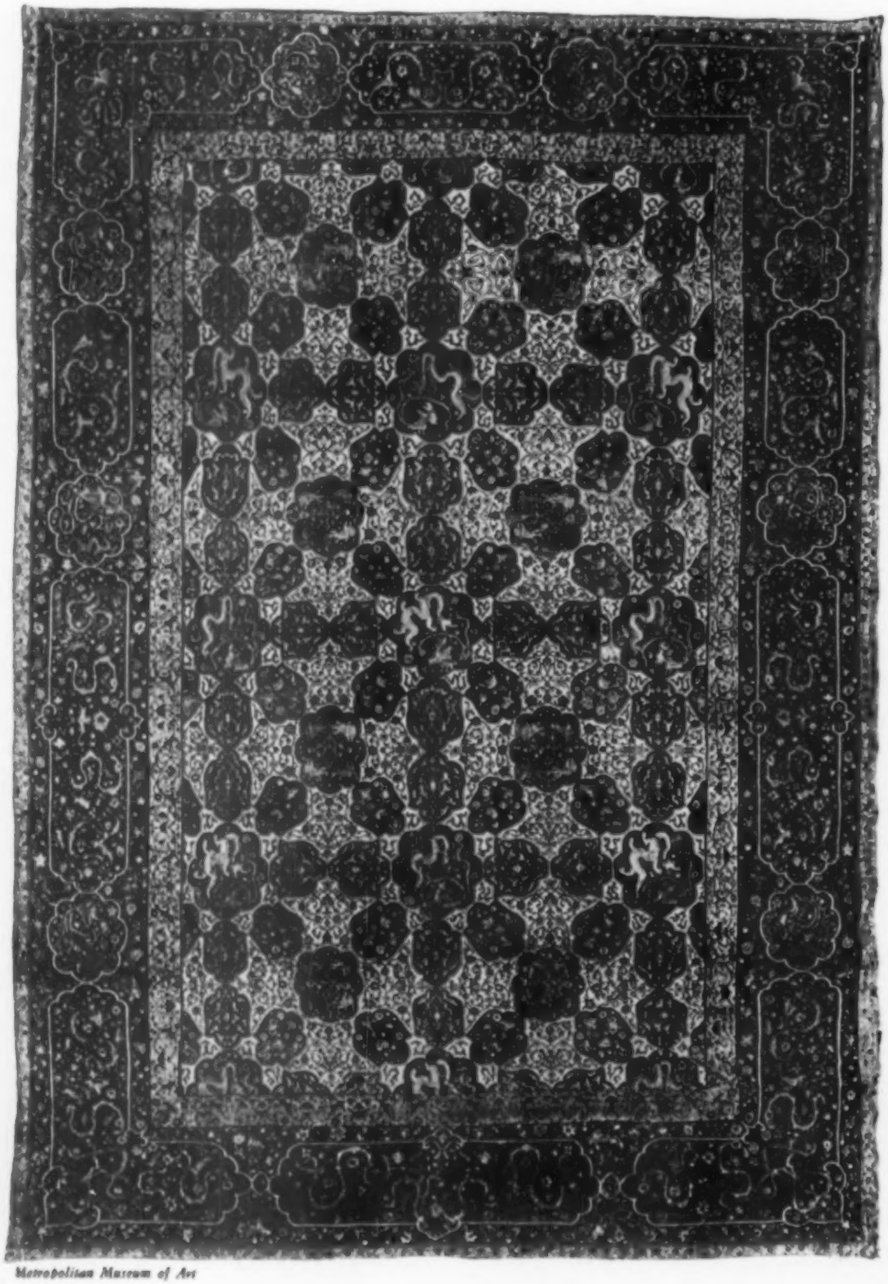
© *Keystone*

After 605 trials and errors, Paul Ehrlich discovered salvarsan.

Maksoud of Kashan and Mrs. McCormick of Chicago

Great carpets and great collectors: the painted, well-nigh priceless wool of Persia.

THERE are four good reasons why collectors don't collect hens' eggs. The first is that their intrinsic value is not great. Eight or ten cents at the outside. You can't seriously collect something you can replace on the open market for eight or ten cents. The second is that the beauty of a hen's egg tends to repeat itself. It becomes monotonous. In a way, when you have seen one hen's egg you have seen all the hens' eggs there are. People simply won't go on down the gallery to look at the rest. The third reason is that you have no assurance of rarity. Even though Mr. Raskob, for example, were to make the most complete and comprehensive collection of hens' eggs ever seen on this earth and were to destroy all the residue, he could have no confidence that the world's hens would not lay his treasures into complete obscurity the next morning. And finally there is no lore of the hen's egg. You cannot be erudite and scholarly and profound about the difference between a "Nineteenth century black Minorca: northeastern U. S.—excellent state of preservation" and a "Contemporary buff cochin: origin unknown: slight abrasion in upper right-hand corner: Mulrooney collection." You can't talk about the Evanston Egg the way one would talk about the Ardebil carpet.



Metropolitan Museum of Art

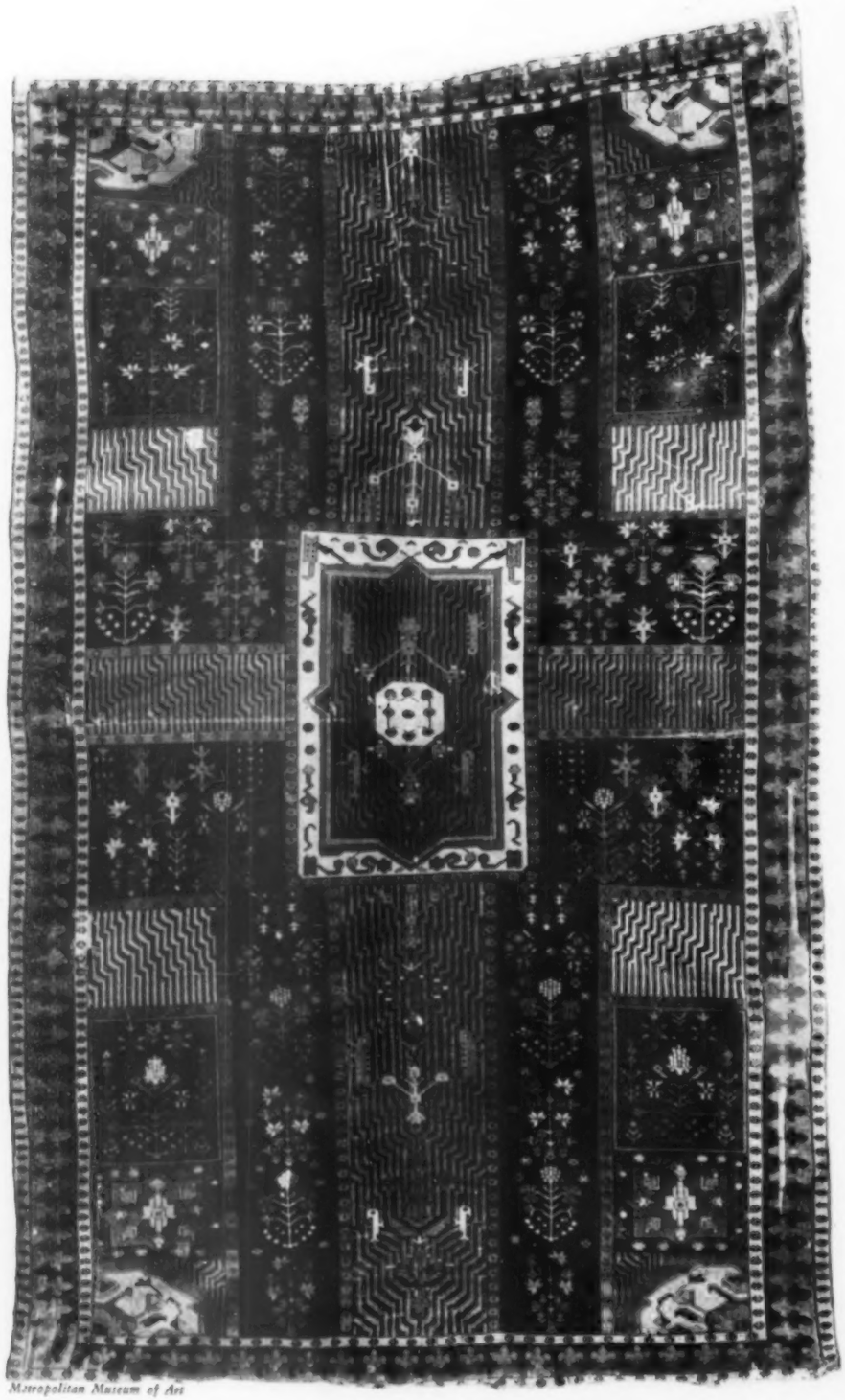
There are also four good reasons why collectors do collect antique Persian rugs. And they are the same—with opposite effects. Persian rugs are not only collectors' objects: they are the greatest of all collectors' objects. They provide the amateur with every possible thrill. Their value is very high: somewhere between the square foot price of New York real estate and the square foot price of the *Blue Boy*. They are extremely beautiful and the archaistic, formal quality of the design of the oldest pieces is peculiarly appealing to our generation. They are, as a class, the rarest of all seriously collectible works of great art. There are subdivisions of ancient work, instances of which are, of course, harder to pick up. But there is no other case where the major artistic production of a great nation is at once so well known and so hard to find. And as for the lore of the Persian rug—there is a body of erudition into which the specialist can disappear from the vulgar eye like a porpoise plumping into a bed of kelp. There never was so deep a sea of learning.

The Golden Fleece

Value in the art business is an uncertain thing. Unless someone, for reasons which may or may not be esthetic, desires to buy the *Blue Boy*, the *Blue Boy* is merely a somewhat insipid picture by a not altogether first-rate painter. But if someone does desire to buy the *Blue Boy* badly enough, the *Blue Boy* becomes the most valuable picture in the world. The same thing is even more true of rugs, because the market for rugs is smaller. There is only a handful of people who buy rugs—great rugs. If the handful isn't interested, there is no market, and if there is no market there is no price.

Metropolitan Museum of Art

EARLY 16th CENTURY MEDALLION CARPET FROM NORTHWEST PERSIA.—This is one of the great rugs of the world. Only two or three carpets of this type are known to exist: one in the Metropolitan Museum in New York. Bought in 1910 for less than $20,000, the Metropolitan could conservatively estimate the present value of this piece at from five to ten times that sum. [*Complete design on page 46.*]



Metropolitan Museum of Art

But in spite of that fact, rug dealers have attempted to state general prices for the painted wool. One expert recently gave it as his opinion that woolen antique rugs of the great era were worth about $500 a square foot (land at No. 1 Wall Street has sold at over $700). Another, an Englishman, has attempted to value the carpet from the Mosque of Ardebil, now in the Royal Victoria & Albert Museum in London, the greatest of all carpets, in the following way:

A new rug of this area with this number of knots to the square inch would cost about £1,585. And the value of a rug doubles every century. And this carpet is four centuries old. Hence its value, according to the rule, should be £25,360. But the excellence of this particular rug is such that we might as well double its value again. Result: £50,720.

There are two all too obvious vices in the method. The first is that Maksoud of Kashan, who made and signed the rug in 1540, has been dead for some time and there is no comparable modern work at any price. The second is that there is no way of telling what Edith Rockefeller McCormick or Mr. Mackay or Mr. Morgan would give for the Ardebil carpet if it were put up for sale.

It is wiser to compute value from prices actually paid or actually offered and refused. The excellent collection of Charles T. Yerkes was offered for sale in 1910. The prices obtained as contrasted with the prices paid by Mr. Yerkes were as follows:

	Cost to Mr. Yerkes	*Sale Price*
Persian 16th century	$15,000	$ 9,500
"Polish" (Persian) 16th century	12,500	12,300
Ardebil silk	15,000	35,500
Old Persian Ardebil	15,000	15,200
Northwest Persia, early 16th century	30,000	19,600
Persian State, 16th century	30,000	33,000
Ardebil wool	30,000	27,000

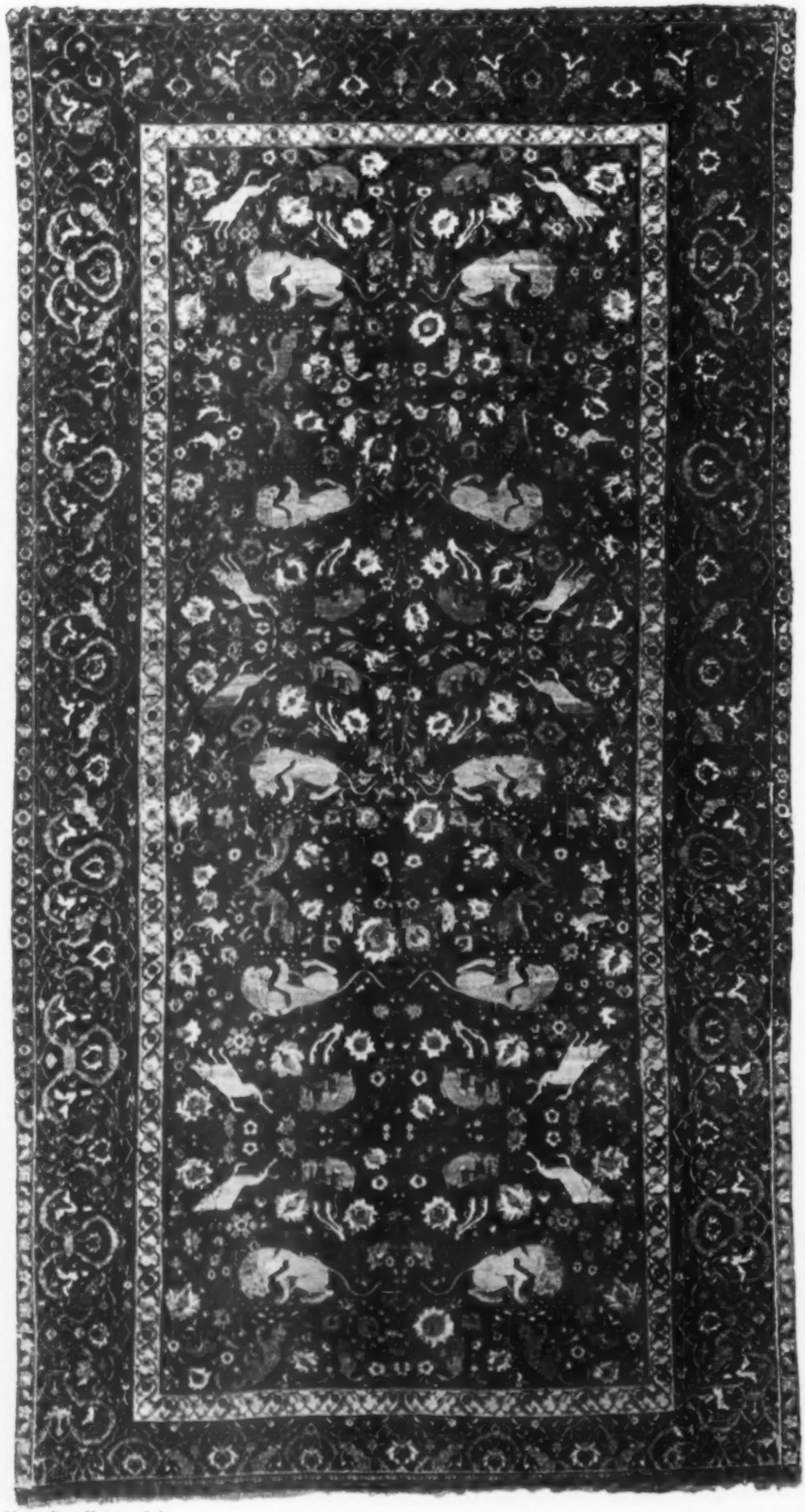
These prices were considered low at the time. The fifth rug in the list, which was purchased by the Metropolitan Museum, is now valued by dealers at anywhere from five to ten times the price it brought in 1910.

Another advance in price authenticated by actual offer and sale is that of a royal Persian animal rug of the 15th or early 16th century, originally a gift from the Shah to the Sultan. It was bought by Benguiat Brothers at the sale of the Marquand Collection in 1903 at a price of $38,000. J. P. Morgan immediately offered $50,000, which offer was refused. And in 1926 the rug was bought by Parish-Watson, a dealer, for $100,000. It is eleven feet, ten inches, by six feet. A much larger rug picked up in a fragmentary state in Spain by Kelekian, a dealer, and sold to Elbert H. Gary went, at the Gary sale in 1928, for $106,000, the purchaser being an agent for John D. Rockefeller Jr. And Mr. Gary himself offered James Deering of Chicago $125,000 for an Ispahan now in the Chicago Art Institute which Mr. Deering had bought before the War for $58,000 and which Mr. Gary had refused at that price. The offer was not accepted.

But it is as possible for a dealer to overreach himself as it is for a customer to err. A very famous early animal carpet from the former collection of the Emperor of Austria described by the American rug expert, Arthur Upham Pope, as one of the greatest achievements of early decorative art, fell recently into the hands of a certain Behar, a London dealer in Persian rugs, who is said to have paid £16,000 for it. Mr. Behar wished to exhibit his purchase to the American market, but to avoid the payment of duty which, on rugs, was then 55 per cent. He therefore consigned his carpet to the Metropolitan Museum for public exhibition. The excellence of the carpet was such that

Metropolitan Museum of Art

ANIMAL RUG, 16th CENTURY, NORTHWEST PERSIA.—This is one of the best examples of a famous category of carpets. It comes from the royal mausoleum of Shah Ismael at Ardebil and probably dates from the third decade of the century. The rug magnificently combines simplicity of color with intricacy of design, and the drawing is of the first order. [*Complete design on page 50.*]



Metropolitan Museum of Art

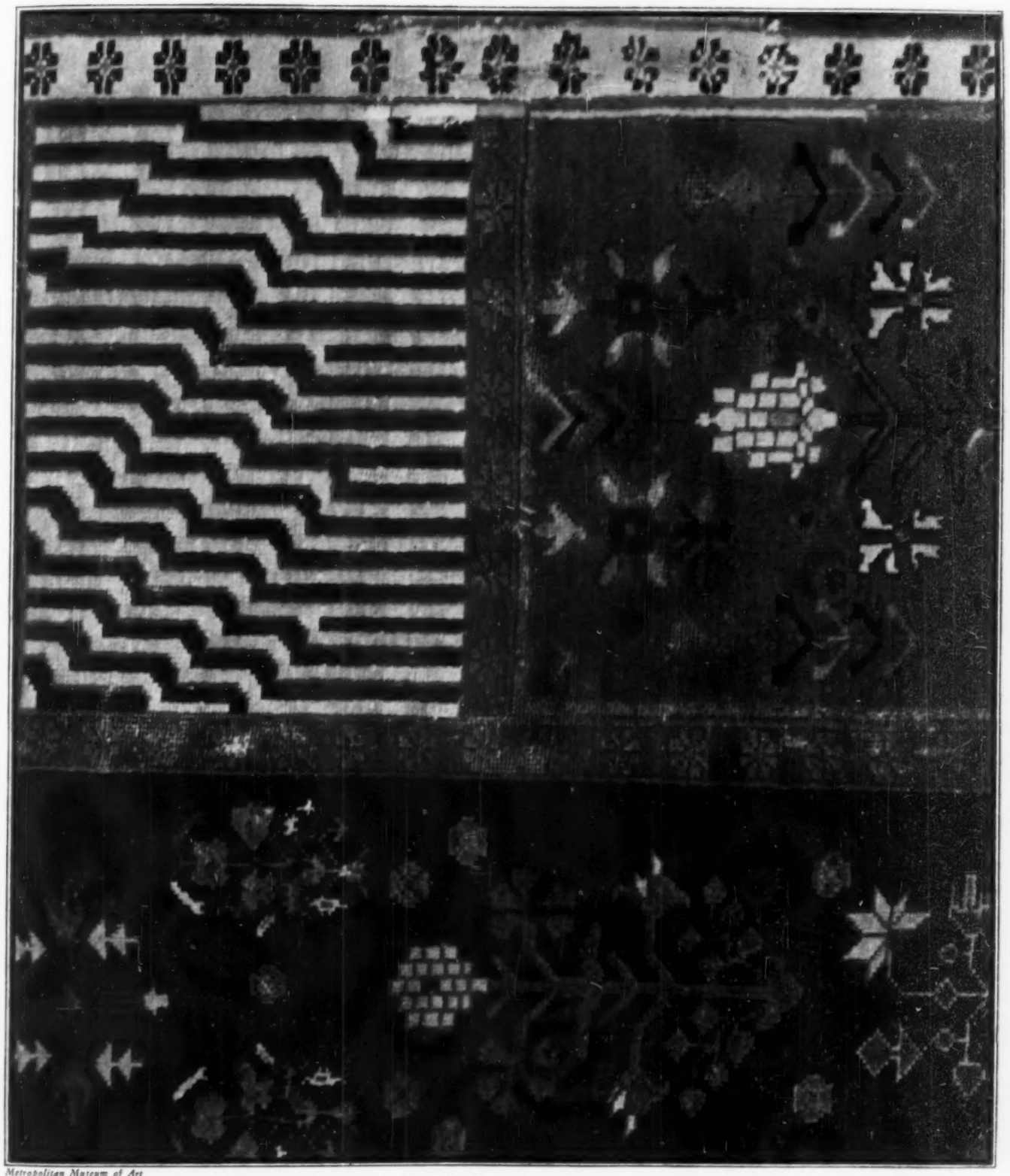
the Metropolitan Museum was glad to show it, and Mr. Behar did the rest. He allowed it to be whispered about that $500,000 would purchase the piece. When his whisper brought no response, he allowed it to be said out loud. And when there was still no interest, he began saying it out loud himself. The upshot was that the Metropolitan Museum demanded the return of the piece abroad. And when it was finally put up at auction at Christie's in London it went to Mrs. McCormick for £22,000.

Dyeing the lily

As to the beauty of the great Persian rugs, a great many books have been written in which the eye of the public has been variously invited to their color, their design, their symbolism, their artisanship, and the blood of the harem beauties darkening their threads. All such invitations to ecstasy in this or any other field of art are futile. No man who does not admire what he sees himself will honestly admire what his betters tell him he ought to see. The most the subtlest writer on such themes can do is to work his own enthusiasm into his description of the object and impart a kind of contagious eagerness to the run of his words. But the rug itself remains its own only description. Even paragraphs evocative of the land which produced these wonders are vain—the golden dome of Kum across the shallow river, or Ispahan, the ruined rose trees and the jackals in the doors. The rugs of Kashan have as little to do with the romantic travelogue writers of our time as the Navajo desert with a movie cowboy. Their great quality is their quality of design. And their design is hard, clear, pure, compressed. They are never naturalistic. No rug of the great centuries of Persian rug making was ever naturalistic. Shapes from the natural world and colors from the natural world were used. But they were first subjected to the requirements of the artist's design; they were "conventionalized." And the difficulty of the medium, the length of time required to make a good rug, the movements of thumb and fingers in the weaving, made it impossible for the artist ever to become fluent, ever to become eloquent, ever to spread himself.

It is because we admire these qualities, because we like early Italian and German painting, because we prefer Bach to Wagner, that we appreciate great Persian rugs today. But that was not their earlier appeal. When they appeared, a few of them, as *tapis polonaise* in the Paris Exposition of 1878, and when they were first seen in quantity in the great Vienna Rug Exposition of 1891, it was their color and their vitality, in contrast with the Brussels carpets of European use, that carried them along. They were not at that time new to Europe. They had been sent by the "Great Sophies" of the 17th century as gifts, and there had been a thriving 17th and 18th century trade in such rugs as the Ispahans and the Polonaises. But they had been forgotten. And their rediscovery

[*Continued on page 100*]



Metropolitan Museum of Art

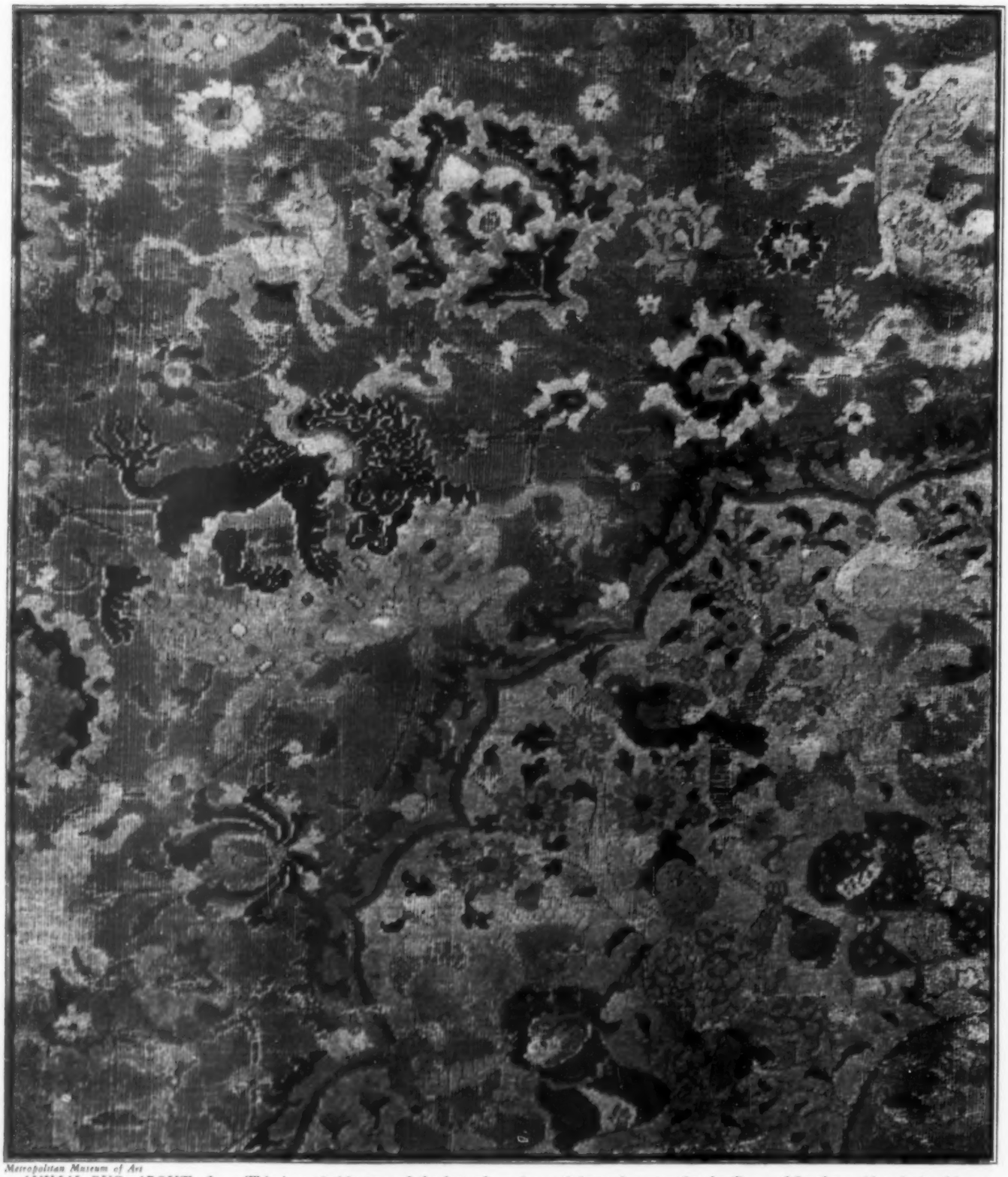
EIGHTEENTH CENTURY GARDEN CARPET FROM NORTH-WEST PERSIA.—A descendant of the "Spring of Chosroes," the enormous garden carpet of silk and gold and precious stones and silver destroyed when the Arabs captured Ctesiphon in the 7th century. The garden paths, the water, and the roses are here shown. Such gardens, walled and overrun with rose trees, still exist in Persia. [*Complete design on page 48.*]

Metropolitan Museum of Art

LATE 16th CENTURY RUG FROM KASHAN.—Maksoud, weaver of the great carpet from the Mosque of Ardebil, was a native of Kashan which, in his time, was a great industrial city of Persia. Today its population is small, and its houses are so plagued by scorpions that few travelers venture to visit it. This rug, of silk, is one of the most beautiful in the Metropolitan Museum.

Metropolitan Museum of Art

PRAYER RUG FROM NORTH PERSIA, ABOUT 1560.—These rugs are called in the East "Namazliks." The arch at the upper end signifies the mihrab in mosque. At the call for prayer the rug is so spread that the arch points toward Mecca. Few Mohammedans of Persia will sell prayer rugs to infidels, but in other Mohammedan countries such rugs are manufactured expressly for the Western trade.



Metropolitan Museum of Art

ANIMAL RUG, ABOUT 1600.—This is probably one of the last of the animal carpets woven in northwest Persia. It represents the stage of transition from the animal rugs of the 16th century to the elegant floral pieces of the 17th woven for the Court of Ispahan. Already in this rug, the animal forms are subordinate to the palmette. Shapes from the natural world, in the great centuries of rug making, were conventionalized.

Nitrogen: I—*The World in Its Place*

At a conference table in Berlin, delegates from three continents remap an industrial world. Into the causes, technique, and possible results of that remapping, FORTUNE here inquires.

IN OSTEND, in Paris, in Berlin, there gathered last summer a most distinguished company of men. They came from three continents, and their purpose was to adjust, in one important respect, the activities of the world. With their deliberations shrouded in secrecy, they met, adjourned to another city, reconvened, adjourned yet again, gathered for the last time in a room overlooking Berlin's Unter den Linden, and at length achieved agreement and success. The world had been put in its place.

The subject of their deliberations, which extended from early June into late August, was NITROGEN. That same nitrogen which is four-fifths of the air we breathe, which in times of war is harnessed to make the crack of a rifle or the explosion of a bomb, which in times of peace fulfills its most useful function as fertilizer. There was represented at Paris and Berlin, last summer, very nearly all that far-flung portion of the world whose business it is to put nitrogen to work. Those who mine it from the earth (there was Chile's able Pablo Ramirez), and those who suck it, all unwilling, from the air (there was keen Dr. Hermann Schmitz, speaking for the mighty I. G. Farbenindustrie; there was Lord Melchett, England's foremost industrialist). There were the technicians (head and shoulders above them stood E. A. Cappelen Smith) and the financiers (many a cable sped back to 120 Broadway, where sat in conference the four Brothers Guggenheim). Almost they had assembled all the pieces which together made the nitrate puzzle, and with great effort they fitted them into a new and compelling picture. Only one big piece was missing (where was Allied Chemical & Dye?); its absence would cause trouble later.

By all odds the most spectacular piece was labeled Cosach. Translated, the label meant the Chile Nitrate Company, and interpreted, it meant a stupendous effort to lift Chile out of industrial chaos. On May 23, the deputies of the Chilean Congress first pondered a Project of Law, designed "to concentrate in one superior organization the management of private enterprises" in the nitrate industry. Each deputy knew this to be the final stand of Chile's great natural nitrate monopoly against the blight of overproduction from within, the blight of synthetic competition from without. Each deputy knew that upon its success depended Chile's prosperity and the future of Chile's budget. Accordingly, Pablo Ramirez, former Chilean Minister of Finance, heard in Europe that the Project had passed amid almost thunderous acclaim. On the eve of the celebration of the first centenary of nitrate exportation, while visiting American professors were gravely accepting university degrees, Don Carlos Ibañes del Campo affixed his flowing signature to the law.

Then had Pablo Ramirez a trump. Then could he take a hand at the picture puzzle on even—perhaps better than even—terms with the others at Paris. For behind him was now the entire natural nitrate industry, compact, backed for dear life by the potent Guggenheims, ready either to shake hands or to hurl yet another glove in the face of the synthetic enemy. Dr. Hermann Schmitz, second in prestige only to the scientist Carl Bosch at the I. G. Farbenindustrie, could not ignore such a new force in the world. Nor could Lord Melchett and Britain's Imperial Chemical Industries. Nor the French Comptoir de l'Azote, nor the Italian Montecatini. Nor the coal and coke operators of Germany, whose ovens last year yielded them 150,000 tons of by-product ammonia from which to make nitrogen. Glittering as had been the triumph of science over nature, yet nature was not altogether crushed. Cosach, in the persons of Pablo Ramirez and Cappelen Smith, declared it could deliver nitrate of soda to meet any synthetic price competition, and make a profit!

And the synthesists themselves were ill-equipped to meet a new situation. Too lavishly had they drawn upon the material made available by science. Fertilizer stocks were mounting until they threatened to burst their silos, and prices were falling. What Germany had begun, England had continued—and Italy and France and Belgium and Poland—until almost every European nation was becoming self-sufficient, while in America were rising the fixation plants of Allied Chemical & Dye.

Thus the world of nitrogen sat down to the conference tables of Paris and Berlin, and pieced together its puzzle. When, on August 9, the last delegate left the I. G. Farben building at 78 Unter den Linden, the picture was as complete as diplomacy and self-interest could make it. The nitrogen map was remade. Under the terms of one of

THE HARBOR OF TOCOPILLA

. . . which will remain a great nitrate port, and the coast range behind it, cutting off the Chile nitrate fields from the sea and from the world beyond.

THE ATACAMA DESERT

. . . where lies buried the world's supply of natural nitrate and of iodine and upon which will rise the Guggenheim centrals.

THESE TWO MAPS OF THE CHILEAN NITRATE INDUSTRY COULD SERVE AS TEXTBOOK ILLUSTRATIONS OF RATIONALIZATION. THE FAR-FLUNG DEPOSITS, THE MANY MANUFACTURING PLANTS, THE LONG LINE OF PORTS—ALL THESE WILL BE TRANSFORMED INTO. . .

the most rigorous cartels in industrial history, each country's production (of synthetic) was severely limited, decreases ranging from 10 per cent in the case of France to 50 per cent for England. Prices were fixed for each product in each country, excepting always America. Into a common pot each of the great companies placed its forfeit, Chile's share alone amounting to $3,750,000. Insofar as diplomacy could devise, the industry was put in its place. And the profits should begin to roll in.

. . .

This convulsive reorganization of a major industry, by far the most challenging industrial event of the year 1930, is of immediate concern to American industry and American investors. Not only because of the large stakes held by the four Brothers Guggenheim. And not only because it may be a threat to one of the newest of America's corporate giants, the Allied Chemical & Dye. But in all probability, the American investing public will be asked to share in the Cosach enterprise. Last July, therefore, FORTUNE sent its representatives both to the natural nitrate fields of Chile and to that greatest of synthetic plants, the Leunawerk of the I. G. Farben. The material they gathered, both analytical and illustrative, is condensed within the following pages.

Nitrogen: II—*Chile*

After 100 years, an industry takes a fresh start. The Guggenheims begin where Don Santiago stopped. And provide a copybook example of Rationalization.

THE most civilized, the most blasé man in the world cannot be entirely indifferent to the knowledge that he is directly above the equator. So small a matter as having the water run out of his bath counterclockwise instead of clockwise upsets him a trifle as he enters the Southern Hemisphere. The sight of cavorting whales and seals, who obviously belong in the Antarctic, adds to his perturbation. And from Callao to Valparaiso—six days by the fastest liner—he may scan the shore as long as he likes and see not a tree or a cactus or a blade of grass. Unless, with the aid of binoculars, he peeps into the garden of some prosperous Don Quixote who can afford to buy some black dirt and squander sweet water upon it. Or unless he visits a rancho such as that of the busy and prosperous Lautaro Nitrate Company or the public squares and swankiest drives of the larger ports. The ground is uniformly sterile, and water fit to drink or to use for irrigation must be brought all the way from the Andes in pipe lines across the Desert of Atacama. A long search will fail to find a more poorly favored land than the northern provinces of Chile, yet it was to determine sovereignty over this territory that the bloody War of the Pacific was fought to its inconclusive finish, that the long Tacna-Arica dispute was waged, and that General John J. Pershing's teeth were so long neglected.

This desert produces nothing usable for fuel, not even sagebrush. It contains one tiny fertile spot which grows a few oranges. Other than that nothing is or can be grown there. It has only one river, the brackish Loa, water from which has to be distilled before it can be used. It is separated from the fertile Argentine by the Andes, and from the Pacific by the coast range. But lifeless, remote, and barren as it is, it has largely paid the expenses of the Chilean Government during the past five or six decades, and has put into the pockets of American farmers some $937,000,000 in a hundred years.

As there are reasons for the reverse motion of the water in the bathtub, for the presence of whales at the equator, and for the sterility of the west coast, so there is for the glittering paradox of the Atacama Desert, but it is hidden beneath from three to four feet of

gravel and dust. The reason is *caliche*, a rock of less than granitic strength and of quite ordinary appearance. It is remarkable in that it will sputter and sparkle in the flame of a match or even on the glowing end of a cigarette. In it, besides quantities of table salt heavily burdened with impurities, some carbonates, phosphates, sulphates of little or no commercial value, a great supply of iodine and the only natural nitrate fertilizer that has yet been discovered. In this desert, within an area of about 25,000 square miles, 7,500 miles in an air line from Berlin, 5,000 miles from the U. S. cotton belt, is concentrated the world's entire visible supply of a substance long acknowledged to be indispensable in war and now held necessary in peace—a whitish crystal which is an important component of the explosives which for four years deafened Europe, which together with potash and phosphates makes German tomatoes redder, cotton bolls fatter, Iowa corn taller, and the entire world richer.

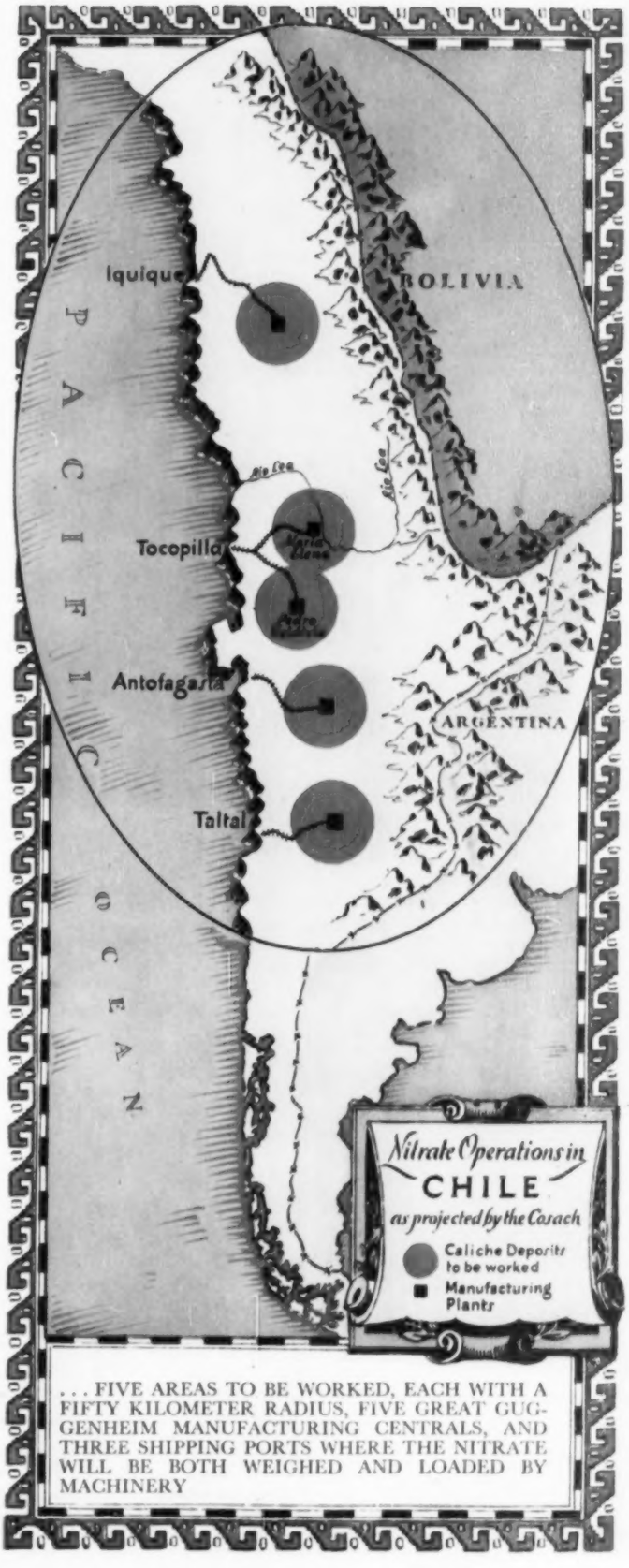
Laboratory of the gods

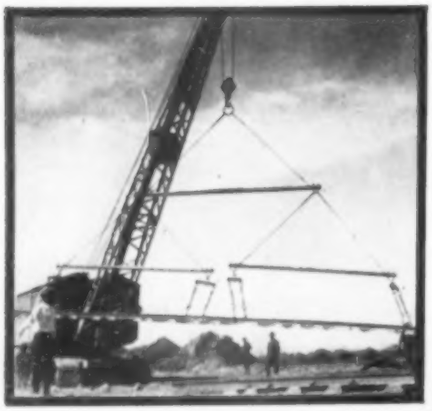
Ever since the first discovery of this nitrate deposit, the chief interest of man has been in methods of extraction and transportation. But scientists have found time to speculate as well on how it came to be deposited there in the first place. That they should have approached unanimity in the opinion that here was once and may yet be the world's one great celestial nitrogen fixation plant, makes their archæology of uncommon interest, for it brings the natural and synthetic nitrate producers into conflict in yet another particular. The theory of Pissis, advanced by him in 1887 and adopted largely by Ochsenius and Muntz and Humberstone, each with some reservations or amplifications, is that great electric storms must have raged over this plain in some geological age when the Andes and the coast range were sufficiently low to permit such storms to cross, fixing the nitrogen of the atmosphere and forming nitric and nitrous acids. Today the coast range rises like a giant breakwater, but the static electricity accompanying the dense fogs which drift up the valleys accomplishes more slowly, and in lesser degree, the same effect. The acids created by this terrific and demoniacal catalysis of the heavens fell to earth and, reacting upon the bases in the soil, produced the nitrogen compounds to be found in the *caliche*. Virtually all researchers are agreed that some of the deposit was formed in this way. The reserve may have been augmented by the work of microörganisms in the bed of this primordial sea, or in many another way. But in the now cloudless blue sky whence never a drop of water falls on the Chilean pampas was once a fixation plant which required none of the intricate and costly machinery which is part and parcel of the competing synthesists.

On this dreary plain, no one knows how long ago (but certainly prior to 1760), with the crudest of mechanical devices, Spanish priest and Araucanian Indian began to extract Chilean nitrates of soda (long erroneously called "Chile saltpetre." Saltpetre is *potassium* nitrate, useful also as fertilizer). The theory upon which the most primitive lixiviation was based and that upon which the elaborate new Guggenheim process operates is one and the same: namely, that sodium *nitrate* is more readily soluble in hot water than in cold, whereas sodium *chloride* (with which it is found in greatest abundance) is only equally soluble in hot water or cold, and much less soluble in hot water if that water already contains sodium nitrate. The action, therefore, is physical, not chemical, its graphic explanation a table of solubilities and not a sequence of formulas. A hot solution of the nitrate and the chloride of sodium drops the nitrate as it cools, but keeps the chloride.

Birth of heroes and monoply

When James Thomas Humberstone landed at Pisagua on January 6, 1875, there were in operation some 165 nitrate plants, ninety-four of diminutive and crude type, producing 120,000 tons annually, and seventy-one equipped with machines which delivered slightly over 800,000 tons to the scattered barnacle-like port towns that cling to the Cordilleras. That most of the nitrate deposits lay within the boundaries of Peru and Bolivia did not much concern Chile, because all of it had to be shipped from Valparaiso. To that port it went in


Iquique
BOLIVIA
PACIFIC OCEAN
Tocopilla
Antofagasta
ARGENTINA
Taltal
Nitrate Operations in
CHILE
as projected by the Cosach
Caliche Deposits to be worked
Manufacturing Plants
. . . FIVE AREAS TO BE WORKED, EACH WITH A FIFTY KILOMETER RADIUS, FIVE GREAT GUGGENHEIM MANUFACTURING CENTRALS, AND THREE SHIPPING PORTS WHERE THE NITRATE WILL BE BOTH WEIGHED AND LOADED BY MACHINERY



A MAJOR PROBLEM SOLVED

. . . with movable rails (left) and a movable power line (right). This electric transportation together with mechanical mining has made it possible for 165 men to do the mining once done by 2,450. Below:

THE PAMPAS FROM THE AIR

. . . showing the test holes sunk by government nitrate ore census takers—a million hole golf course with no greens or water hazards.

Photographs by Fortune-Chile

small coasting vessels to be concentrated in larger bottoms for transportation around the Horn to Europe and North America. Also from Chile the *oficinas* in the pampas bought fuel, forage (for the mules which have now been replaced by railroad and *camion*), and supplies. Chile made its profit in freight and handling.

But when in 1876 the government of Peru seized the *oficinas* and turned them over to the Bancos Associados (a British and Peruvian holding company), controlled the output at 350,000 tons per year, raised the price (per ton) from £12 to £18, and began to consign all shipments in vessels which brought in fuel as ballast, Valparaiso began to feel the pinch of circumstance. For Chile owned only the least important of three divisions of this desert, that which lies behind the port of Taltal. Bolivia held the more profitable deposits immediately to the north, in what is now the province of Antofagasta. Peru held the province of Tarapaca. Chilean nitrate commerce immediately dwindled to the sale of provisions and forage from the agricultural provinces in the south. No longer did it handle either the fuel or the product of the plants. In the Bancos Associados were the seeds of the War of the Pacific which soon flared up, sweeping the Chilean Army into and out of Lima, the Peruvian Army over the edge of the Morro del Arica into the sea, and filling the halls of fame of both countries with ample quotas of heroes. Chile occupied the nitrate districts in 1880, and by the terms of peace concluded two years later acquired them forever, thus establishing the world's premier example of a natural monopoly. It was both easy and logical for Chile to impose an export duty upon this vital commodity and reduce Chilean taxes to microscopic dimensions ($12 per ton on 2,500,000 tons equals $30,000,000). In 1894 the nitrate industry was paying nearly 68 per cent of the costs of the government; in 1929, with the industry in the doldrums, it paid over 23 per cent. For the entire fifty-year period, it averaged the extraordinary figure of 43 per cent.

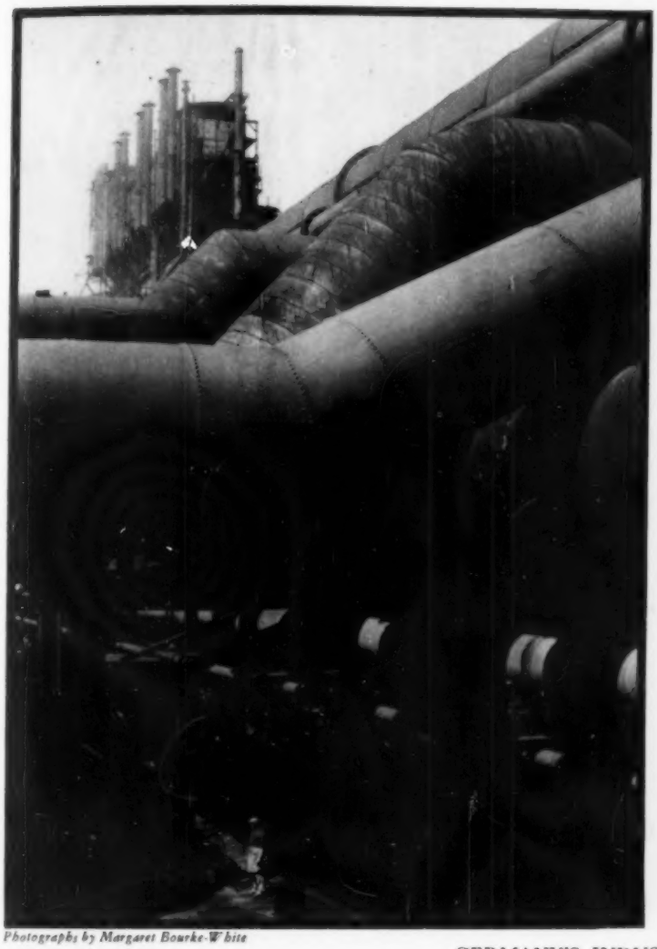
HIC IACET

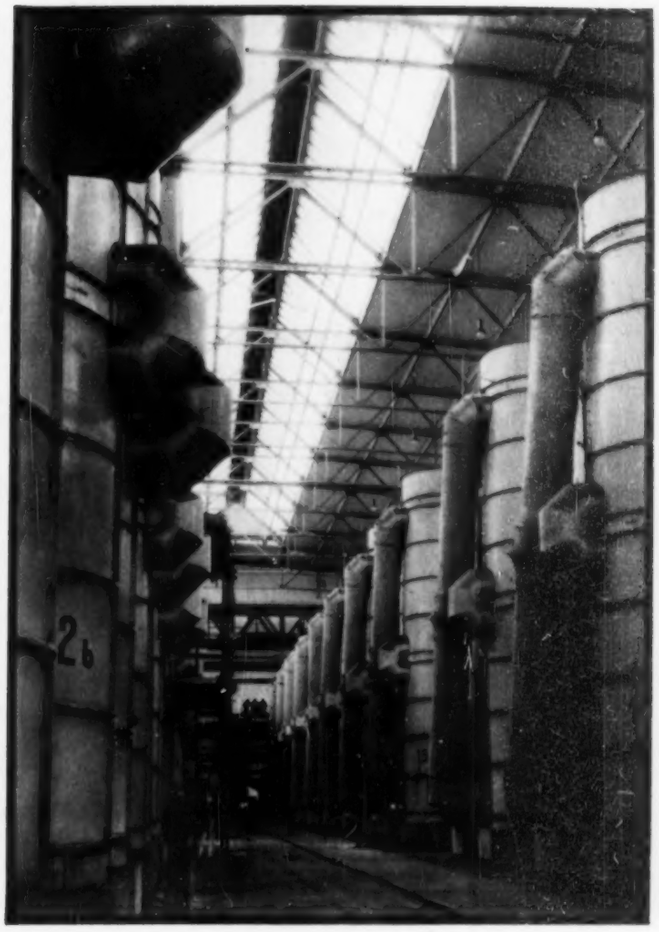
When a worker is killed at his task, the place is marked with a wooden cross by his friends. Though he may be buried miles away, the cross is decked with paper flowers, and at its foot burn candles in lanterns improvised from Gringo oilcans.

James (early rechristened Don Santiago) Humberstone still lives in Iquique. His memory and his activity cover the entire modern history of the industry which has been the backbone of Chile's life and which made itself the most internationally conspicuous of all the world's industries in 1930.

It was he who developed the Shanks Process, which rapidly became universal in the nitrate *oficinas*. Shanks, in England, had discovered the elementary principle in leaching sodium *carbonate*, namely, that a weak solution (and hence of lower specific gravity) introduced into a tank containing a stronger (and heavier) solution, will force the heavier solution on through a series of tanks equipped with *transito* pipes. Except for its basis upon this *theory*, the Shanks nitrate process owes nothing whatever to the scientist for whom it is named. The nitrate industry of Chile as it was recently discovered by the Guggenheims is the creature of the engineering and chemical genius of Don Santiago Humberstone. It is interesting that he hoards no fortune acquired in patents, has to show for his half century of labor, in addition to earnings in his own company, only the universal admiration of his adopted country and a tremendous silver medal, given him at the time of his retirement by a grateful, but at that time impoverished industry.

Don Santiago watched exportation from the 165 nitrate *oficinas* increase from 323,642 metric tons in 1876, through the banner year of 1916 when 2,988,369 tons were mined, to the birth of the *Cosach*. But since 1926 he has watched his own star fade. The Agua Santa Company, of which he was active head until 1928, has yet to follow the vast majority of the nitrate producers (certainly not more than 6 per cent are standing out) in the surrender to the new Guggenheim - government combination on terms which in many cases approach confiscation, but negotiations for its entrance are in active progress. He sees, for it is all about him, the





Photographs by Margaret Bourke-White

GERMANY'S INDUSTRIAL MAMMOTH

Scarcely ever does the sun penetrate to the broad streets of the *Leunawerk*, largest of the world's nitrogen fixation plants. For they are roofed with a network of pipes, some no larger than a man's arm, others six feet in diameter. They are the real traffic arteries of the I. G.'s great plant; through them rushes a constant flow of steam, water, gases, ammonia. On the right, a cathedral-like room in the fixation plant.

replacement of hand mining by mechanical methods which enable 165 men to do the work once done by 2,450. And this is no insignificant matter in a desert which must bring its vegetables 4,500 miles (from California), its sugar 3,000 miles (from Costa Rica), its coal and flour 1,800 miles (from the south of Chile), its beef across the Andes (from the grassy pampas of the Argentine)—the last of these on foot, the others by slow, coastwise steamers. He sees the beginnings of centralization of shipping in two or three ports, the introduction of weightometers and mechanical loaders (though it means the virtual abandonment of Caleta Buena and the Ferrocarril Agua Santa, the first a harbor and the second a railroad which he built himself). He sees the machines which he designed and the processes which he developed being ruthlessly discarded (in most cases without indemnity) to be supplanted by the tremendous centrals where the Guggenheim Process (the work, largely, of E. A. Cappelen Smith, who developed another famous Guggenheim Process at the Chile Copper Co. mines at Chuquicamata) will spray through a dozen pinholes the world's supply of natural nitrate.

Maturity and the Guggenheims

The Guggenheim Process, which is the immediate cause of Don Santiago's fall, had long been growing in the mind of Cappelen Smith. Though the story probably should begin with the great engineer, Pope Yeatman, who secured for the Guggenheims the world famous Chuquicamata copper mine. Fifty engineers had previously declined "Chuqui," declaring that the grade of ore was so low that it could not be worked. But Yeatman knew his copper. Had he not previously bought Braden and all the other low-grade copper mines for the Guggenheims? Cappelen Smith, a native of Trondhjem in Norway and already famous as co-inventor of the Pearce-Smith converter in general use throughout the industry, was sent to develop a process which would recover the copper. He did. By dissolving the ore in cold acids and by electrolytic recovery, he was able to deliver a product which is the standard of pure copper the world over.

This man could not go from Antofagasta to Chuquicamata without crossing the nitrate pampas. It was but natural that he should speculate on the possibility of translating the *cold acid* technique of Chuqui to a *cold water* technique for the nitrate field. Accordingly, he set to work. In three years the chemistry of nitrates was rewritten in New York laboratories. Then, to demonstrate these new theories, he built an experimental plant at Oficina Cecilia behind Antofagasta (a property of the Loa Company) and in two years more demonstrated the feasibility of his idea. Immediately the four Guggenheim brothers gathered in their joint office at 120 Broadway and issued orders to buy nitrate fields. They bought at auction from the government a nitrate deposit at Coya Norte near Tocopilla and added to it the Anglo-Chilean Nitrate Company grounds at Coya Sur. On these lands the spectacular Oficina Maria Elena was built and put into operation at the end of 1926.

Here with mammoth electric Bucyrus

shovels, the three-foot layer of overburden is scraped away, the *caliche* is "lifted" by blasts utilizing as much as 7,000 pounds of black powder (made in the plant from nitrate of soda and charcoal) in a single shot, breaking up in a few seconds 10,000 tons of the ore. The ore is carried by electric trains to the crushers at the plant (which may, in time, be as much as fifty kilometers from the *rajo* being worked). There boulders are reduced to rocks, rocks to pebbles about the size of a California cherry. Over this part of the plant hangs a pall of dust that settles on everything, caking into mud where oil or water lie. On giant conveyors, this crushed ore travels to vats of five to ten times the capacity of the largest Shanks vats. Water from the brackish Loa, distilled at the rate of 800 tons per day and costing sixty cents a ton, is allowed to seep downward through the ore, dissolving salt and nitrate. When the water has taken up all the nitrate that it can it is conducted away—and herein lies the principal variation from the older Shanks method—at atmospheric temperature. The Guggenheim Process cools this liquor to freezing, and accomplishes, without loss of heat, the same end that previously was accomplished by permitting a boiling liquor to cool to atmospheric temperature. It is not unlikely that here the Guggenheim Process was meant to terminate. But it was discovered that the nitrate, ultimately recovered from the cold solution in centrifuges, was so finely divided, so thirsty that it quickly took up moisture from the air and formed into white boulders the size and shape of the bags in which it was packed and practically impervious to the onslaught of crowbar or pickax.

Wherefore, this product is briquetted, then melted in a shaft furnace, and finally forced through a pipe which terminates in a fine spray cap. The scalding yellow liquid leaps high in the air, where it cools and forms into snow white beads that tumble back into the last conveyor, bound for the automatic weighing and sacking machines. These beads have a glaze which resists moisture and have a much more attractive commercial appearance than that of the irregular crystal of the old Shanks product. They also have a chemical purity of 99 per cent, 3 per cent higher than that of Shanks nitrate. Some agronomists and some of the old nitrate producers insist that this represents no advance or advantage—that in the 4 per cent of impurities in the Shanks nitrate repose many of the virtues of Chile nitrate of soda. But Don Santiago himself comes to the support of Cappelen Smith in this matter again, agrees that there is as much iodine in Guggenheim nitrate as in Shanks.

When the Agua Santa Company enters the *Cosach*, instead of his share in its *maquinas*, the roadway, and rolling stock of the 125-mile railroad, the incline and loading piers of Caleta Buena, Don Santiago Humberstone will hold only a sheaf of papers which represent an interest in the new company. He knows that until rationalization is completed, these papers will be worthless. And if his enthusiasm for the *Cosach* is less than vociferous, it is greater than that of some of his colleagues. They (not he) are inclined to use such ugly words as confiscation. For nitrate production under the *Cosach* will ultimately be centered in five tremendous plants—one near Taltal, two (Maria Elena and Pedro Valdivia) near Antofagasta and Tocopilla, two in Tarapaca, near Iquique. Each of these will work a *caliche* deposit fifty kilometers in radius. And, although all present *oficinas* contain machinery and materials that are far from disintergration, it must all be abandoned without indemnity, for none of it is adaptable to Guggenheim plants.

DON SANTIAGO HUMBERSTONE

Father of the nitrate industry, developer of the Shanks Process, which has made in fifty years some 70,000,000 tons. About nitrates he knows more than any other living man. Against *Cosach* he holds no grudge, although it will supplant his process with another.

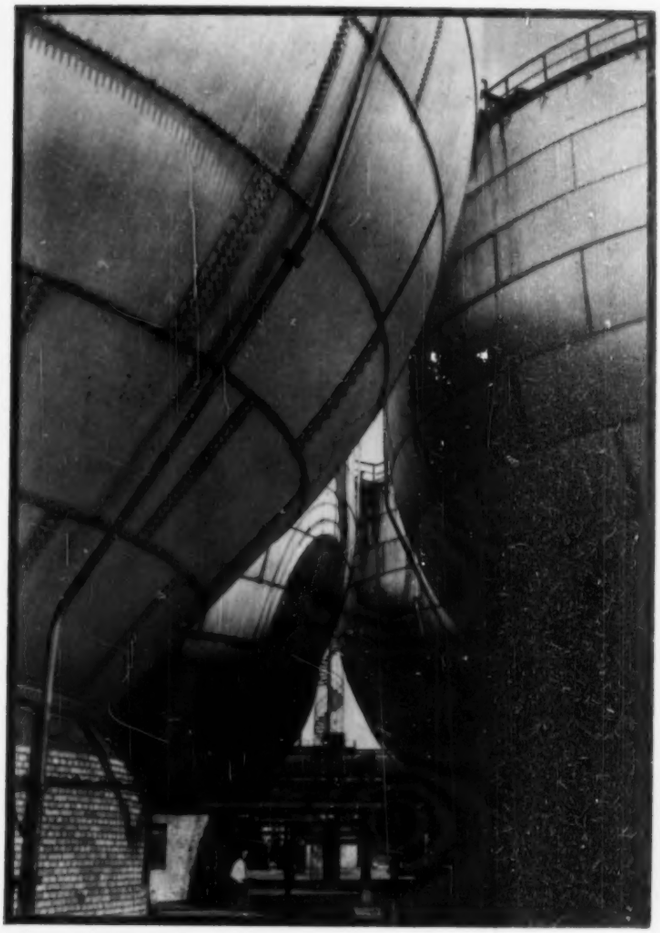
Merchants in the ports also raise their protest against centralization of the export. With the exception of Taltal, Antofagasta, Tocopilla, and Iquique, all the seaports along 600 miles of Chile's coast will virtually disappear, for there is no other product in the region except copper, and already its export is centralized in Antofagasta and, farther south, in Chañaral. Even Iquique will suffer for years to come, because Maria Elena and Pedro Valdivia between them will produce from 1,000,000 to 1,500,000 tons of nitrate, and are the only ones immediately projected for construction. The present population of Iquique is about 40,000. Optimists say that it will not drop below 10,000; pessimists think 5,000 a high expectation. Caleta Buena to the north now employs some 300 men to move 8,000 tons per month from car to ship. These men can move a thousand miles to the south of Chile and find work on the farms of that fertile district. Or they can starve.

NITRATE CRYSTALS

. . . before removal from the crystallizing vats of the Shanks Process as it is applied in Oficina Chacabuco (Lautaro Nitrate Company), largest existing Shanks plant.

CALDO IN THE VATS

. . . ready to drop its nitrate crystals as the boiling liquor cools. Beyond the tanks, mountains of nitrate in open air storage waiting to be bagged and taken to the port.



Photographs by Margaret Bourke-White

AMMONIA TANKS AT LEUNA

It is said that so daring a move as this of the Guggenheims would have surely caused revolution except for the favoring conditions of a stricken industry and a popular president. Don Carlos Ibañez del Campo, one-time *carbinero*, is *of* the People. The People are confident that he is *for* them as well. But there are hot-heads—youngsters, chiefly—who do not see the whole picture. University students, for example, declare that Chile has been sold down the river. A cordon of forty *carbineros* was required to hold the students at bay outside the grand hall of the Universidad de Chile during the ceremony of conferring honorary degrees on four prominent American agriculturists in the nitrate centenary week. These are the Unreasonables. They cannot properly weigh the starved seaports against the glamorous thing called Rationalization. They still live in that carefree time when Don Santiago Humberstone was young and when no one had thought of raising the mammoth towers of *Leunawerk*. They are futile and rather silly in their vain tilting of lances, for the *Cosach* and the results of Paris are quite literally Chile's golden hope. But it is possible to excuse them—even the Guggenheims will excuse them—if they do not raise their cheers.

Nitrogen: III—*Biggest Leuna*

How the Pride of Europe started something and why it could not control it.

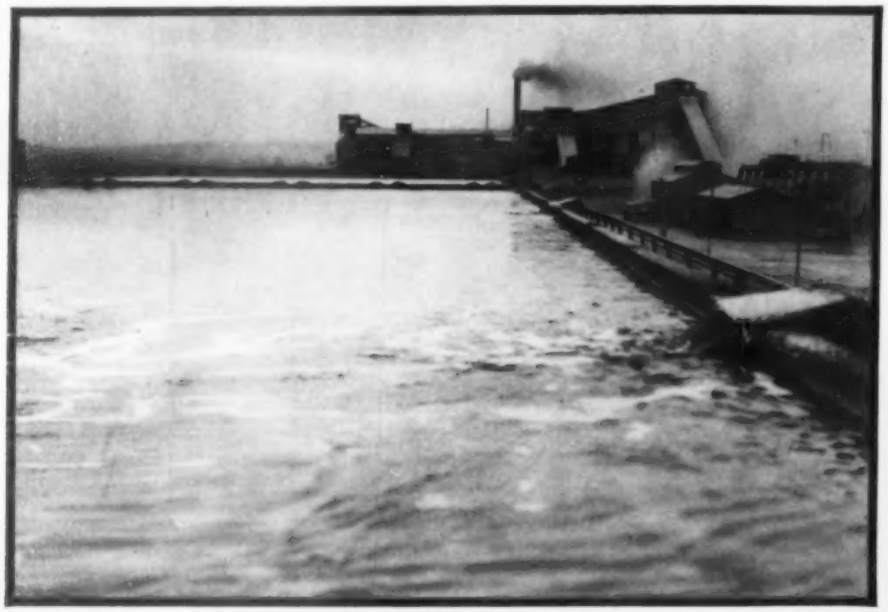
IF this first Paris group represented one of the most rigid of natural monopolies, the secong group spoke for a scientific achievement no less notable. What Chile had mined from the earth, Germany had drawn from the air. With tremendous effort and expense. Partially by accident, but chiefly by design. And with brilliant success.

To look at the *Leunawerk* of the I. G. Farbenindustrie is to be conscious of no accidental quality. Rather does this 1,500-acre square—the largest nitrogen fixation plant in the world—appear the ultimate monument of industrial design. Here are streets whose roofs are incredible networks of pipes, weaving endlessly from generators to gasometers, from compressors to contact ovens, a ganglia of chemical blood vessels, with veins a few inches wide, with arteries through which a man could walk erect. And through this ganglia rushing rivers of water (enough each day to supply Chicago), torrents of steam (from the world's greatest generating station), of strange gases, of hydrogen, of the ammonia which this gargantuan city was built to produce. Nowhere does the *Leunawerk* seem less accidental than at its terminus, the final goal of all these pipes, the silos from which calcium nitrate and ammonium sulphate are loaded into cars and shipped to the world. The greatest of these silos would make a roomy packing-case for the Coliseum. Here rise glistening white mountains of fertilizer

Courtesy Anglo-Chilean Consolidated Nitrate Corporation

ORE BY THE TRAINLOAD TO MARIA ELENA'S CRUSHERS

Now trainloads of ore in chunks as large as boulders wait their turn on sidings below the giant preliminary crushers. The dust cloud in the distance hides the crusher from sight day and night except for an hour or two at dawn when its jaws are rested and overhauled.



VATS OF THE NEW ORDER AT MARIA ELENA

Twenty such, each with a capacity of 7,850 tons of ore, meet the eye of visitors to this first Guggenheim plant. Shanks Process men gape at them, goggle-eyed. Never before have they seen vats larger than 1,800 tons capacity; few are more than 500. The liquor pouring in from the side pipes will dissolve the nitrate.

(ammonium sulphate), into which dig endless shovels upon endless belts and upon which pours a perpetual rain to replace what the shovels have carried away.

The *Leunawerk* is unquestionably the most impressive industrial exhibit in Europe. Fittingly, it is the particular pride of Europe's mightiest industrial enterprise. For the company which shortens its interminable name (*Interessen Gemeinschaft Farben-Industrie Aktiengesellschaft*) to I. G. Farben has the largest capitalization ($250,000,000), enjoyed in 1929 the largest net income ($25,000,000), and employs the greatest number of men (130,000) of any concern outside the U. S. It is also the most modern of European companies, and together with Krupp the most technically progressive and efficient. The fixing of nitrogen, which is carried on chiefly at the *Leunawerk* but also at the smaller *Oppauwerk*, occupies only one of I. G.'s innumerable hands. At *Leverkusen*, another industrial mammoth which Dr. Carl Duisberg magnificently built across the Rhine from Cologne, I. G. centers its manufacture of pharmaceuticals. Here, and at Hochst, Frankfort, Ludwigshafen, are the great dye plants, the product of which formed the basis of the mergers which evolved I. G., and even today, despite the prominence of nitrogen, perhaps the most stable factor in the I. G. set-up. But even with nitrogen and dyestuffs, the list of major I. G. activities has only begun. The patents on its leading synthetic medicines (see page 45), to which each year its laboratories make new contributions, provide it with a wide and sure market. Last month, the two I. G. chiefs—Dr. Hermann Schmitz and Dr. Carl Bosch—were expected in America to discuss their newest enthusiasm, the hydrogenation of oil. Already, I. G. has divided the world with Standard Oil of New Jersey in a pact which points to the time when gasoline recovery from crudes of 90 per cent (a reported result of Standard's first experiments under I. G. patents) will be economically efficient, when at last coal and tar must be tapped to supply even the minimum world demand for oil.

Thus the I. G.'s importance is not at all confined to the field of nitrogen, although within this field it has been most generally and spectacularly publicized. The importance of I. G., indeed, may very well be said to be European, if not international. As Europe's greatest company, largest employer of labor, its stability and prosperity are matters of concern to the entire continent.

The *Leunawerk* was an accident because its giant builder did not foresee its real use or its real significance. *Leuna* sprang from the War emergency, an answer (to cost, eventually, $75,000,000) to the question of how to make explosives without Chilean nitrate. With the steel ships of the blockade steaming

E. A. CAPPELEN SMITH

The genius of Chuquicamata and of the nitrate industry. Time and the future price of nitrate alone will determine whether his mammoth plant at Maria Elena was a promise or a warning.

Photographs by Margaret Bourke-White

WORLD'S LARGEST SILO

Here stand great mountains of ammonium sulphate for which the I. G. Farben sucks nitrogen from the German air. But of late months the piles of fertilizer on the left have risen faster than the shovels on the right could carry them away for sale. Over-production and competition have brought I. G. into the new cartel.

between South America and Germany, a nitrate import amounting to some $50,000,000 a year was abruptly ended. But explosives could not be made without nitric acid. Hence the *Leunawerk*, made possible by a half-century of research in the U. S. and abroad, made practical by the fiercely precise mind of Fritz Haber, built by the BASF (Badische Anilin und Soda-Fabrik), and paid for by the government. Its War purpose was brilliantly served. From the air, *Leuna* drew its nitrogen, joined it with hydrogen under a pressure of 200 atmospheres at a temperature of 600 degrees Centigrade. From the resulting ammonia, during the last years of the War, *Leuna* pointed to an annual production of 200,000 tons of nitrogen, most of which is now mixed with the air above the Hindenburg line.

The War at length came to its end. But *Leuna* remained. And while Krupp could make truck chassis as well as cannon, there was no possible use for nitric acid. It was a new German chemical genius, only forty-four when the War ended, who discovered what to do with *Leuna*. Perfecting the manufacture of ammonium sulphate with gypsum (instead of sulphuric acid), Dr. Carl Bosch became the I. G. chief. Almost from the beginning, *Leuna* could produce 500,000 tons of nitrogen fertilizer each year. The blockade lifted, but Germany took only a fraction of what Chile offered. Feverishly the world was scoured for markets. And the vast *Leuna* silos began to fill.

Today, they are filled very high, and therein is one of the reasons why I. G. sent its smart Dr. Hermann Schmitz to the meeting at Paris. When once the Chilean strangle hold had been broken, synthetic fertilizers appeared throughout the world. Last year Lord Melchett's I. C. I. produced some 250,000 tons; Italy manufactured more than it could use; at Hopewell, Virginia, the newest Allied Chemical & Dye units began to produce nitrate of soda in commercial quantities. Another enormous addition to the stocks of synthetic fertilizers has come from the steel operators of the Ruhr and elsewhere, recovering by-product ammonia from coke ovens and making it into fertilizer. As a result, and in spite of early cartelization efforts, prices of both the natural and the synthetic have steadily fallen, Chile nitrate of soda sinking below $40 a ton, and I. G.'s sulphate of ammonia sinking to $33. All the cultivated fields of the world cannot use as much white powder as is now accumulating in the storehouses. And I. C. I. operated last summer at about 35 per cent of capacity, *Leuna* at not more than 50 per cent.

The size of the *Leunawerk*, the huge investment it represents, is the I. G. problem. The I. G. is top-heavy with nitrogen, as it is top-heavy with the officers of the many companies which it has swallowed, as it is top-heavy with the gorgeous marble administration building at *Leverkusen* (a pre-merger legacy), as it is top-heavy with a list of sixty managing directors and forty-eight members of the supervisory board. As it is top-heavy, if such a thing be possible, with the most trusted and pampered laboratory staff in industry. It is difficult for the I. G. to move. And the last year proved conclusively that in the matter of nitrogen, motion was necessary. Accordingly it brought the great weight of its presence to Paris, entered the conference room where sat the representatives of a natural monopoly which it once thought to have crushed, proceeded to take a hand in the business of putting the world in its place.

[*Continued on page 105*]

Adamses Alive

Include the Secretary of the Navy, "Pop," and Astrologist Evangeline. Notes on the development of one of our first and foremost families.

AN IDEAL aristocracy would surely be one whose members combined distinction of character and mind, lineage and lineament, breeding and deportment, deed and personality. Such an aristocracy is not to be found nor scarcely approached on Park Avenue, nor yet at Southampton, nor yet at Newport. In America its closest approximation is perhaps still discernible in the scattered councils of some very few families. And of these, none is more distinguished than the Adams family, traditionally of Quincy, Massachusetts. It has just been the subject of an able biography by James Truslow Adams (no relation), who traced it from its American beginnings with Henry Adams, a farmer who died in Braintree, Massachusetts, in 1646, to the death in 1927 of the erratic Brooks Adams, historian.

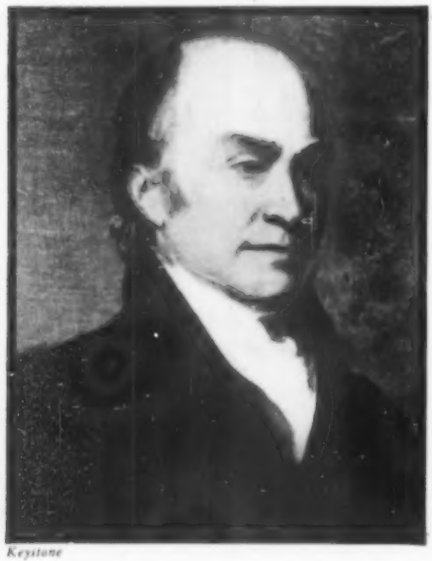
The Adams family produced four distinguished generations of men without taint, high-minded, disinterested, erudite, gracious. They served the state without politics, scholarship without pedantry, and business without sly practice. It is unlikely that the family could have persisted with such honor had not the Adams men habitually mated with women who shared their qualities. These couples formed as ideal an aristocracy as any the U. S. can point to. What has the clamorous, grasping big business era done for their patrician line? Can such a line adapt itself to the new age without losing its distinctive character? In the succeeding pages we shall attempt to suggest an answer to these questions by sketching the background and careers of the living Adamses.

The Adamses were distinguished before they were rich, an unusual fact in a country where distinction so often consists solely of wealth or the methods whereby wealth is obtained. President John Adams was fortunate in his wife, that astonishing matriarch and lady of letters, Abigail Smith, about whom it might perhaps be said that she was an even greater woman than he was a man. But John had very little money. His son, President John Quincy Adams, also enjoyed a remarkable spouse, graceful and stout-hearted Louisa Johnson, daughter of the Maryland squirarchy, who had spent most of her girlhood in France. But John Quincy had as little of the world's goods as his father. These men were too busy as pioneer American statesmen to accumulate money. It was not until the third generation that the Adamses acquired money and then, as might have been expected, it came from the remarkable distaff side of this remarkable family. Charles Francis Adams, the grandfather of the present Secretary of the Navy, married the daughter of the merchant, Peter Chardon Brooks, Boston's first millionaire. Old Peter Brooks settled on his daughter and her husband some $300,000, which must have been somewhat embarrassing for Charles Francis, who was as unused to the dry crackle of bank notes as his forebears. He had been engaged in such unprofitable employment as Minister to the Court of St. James's (throughout the Civil War), a post which rewarded him as richly in public repute as it prevented him from making a good living.

But the $300,000 undoubtedly helped to fledge Charles Francis's four sons. As the first substantial capital in Adamsian history, it was no doubt partly responsible for the fact that this fourth generation was the first of the line to appear at all prosperous. This was the crucial, the telling period. The Civil War was over. Out of its ashes was rising the grimy and enormous phœnix of American industry. Opportunities for aggrandizement were everywhere; the impulse to it was a nation-wide contagion. Even the stately Brahman strongholds of Boston succumbed, and the prim façades of Beacon Hill and Commonwealth Avenue began to be as bank vaults concealing great fortunes quietly but shrewdly made in textiles and shipping and western railroads. How did all this affect the brilliant, scholarly, conscientious Adamses? One might expect that they would have abjured the channels of commerce. And one would have been substantially correct regarding three out of four of the Minister's sons. The eldest, John Quincy, was disgusted by the Republican conduct of Reconstruction, became the leader of the unhappy Democratic cause in Massachusetts. The peak of his political career was his nomination for Vice President on the same ticket with one of the most obscure presidential candidates in American history—Charles O'Connor. But they failed with the reëlection of the tragic Grant. John Quincy died in 1894, twenty years before the next brother. His fortune, remarkable neither for the times nor for Boston, was rumored to be in the neighborhood of $1,000,000, which was probably largely obtained by the judicial investment of his inheritance.

Henry, the third and most celebrated son, and Brooks, the fourth, were the finest examples the family affords of its love of learning. Henry, the Anglophile, Harvard historian, and traveler, speculated on the laws which he conceived must govern human events as other laws govern physical organic change.

[*Continued on page 117*]



Keystone

PRESIDENT JOHN QUINCY ADAMS
1797-1801

Keystone

PRESIDENT JOHN ADAMS
1825-29

MRS. HENRY STURGIS MORGAN (Catherine Adams), daughter of the Secretary of the Navy, married the younger son of J. P. Morgan in June, 1923, one week after he was graduated from Harvard. Last year her husband was made a partner in his father's firm, together with the sons of two other partners—Thomas W. Lamont and the late Henry Pomeroy Davison. By Mr. and Mrs. Morgan, the late President John Adams already has three great-great-great-great-grandsons.

International
MRS. HENRY STURGIS MORGAN

MANY teachers and educators have continued the family's distinguished intellectual tradition. Among them: *Roger Adams*, head of the chemistry department of the University of Illinois. His most important work has been the development of synthetic substitutes for chaulmoogra oil for leprosy and the perfection of Procaine, a non-habit-forming substitute for cocaine. *Edwin Plimpton Adams*, head of Princeton's department of physics, a shy, scholarly product of many institutions of learning. *George P. Adams*, his brother, professor of philosophy at the University of California. *Kathryn N. Adams*, sister of Edwin and George, chief of the Constantinople College for Women.

ROGER ADAMS

Photo Edwin Levick
CHARLES FRANCIS ADAMS AND SON

CHARLES FRANCIS ADAMS, small, tanned, wiry Secretary of the Navy, is the son of the late Democrat and amateur smelt fisherman, John Quincy Adams, who was offered the same secretariat by Grover Cleveland. By most of the family he is considered its present chief. His mother was a Crowninshield from a renowned Massachusetts family of expert yacht designers which produced two Secretaries of the Navy. Everyone knows that the Secretary is an inveterate yachtsman, that it was he who piloted the yacht *Resolute* to victory over Sir Thomas Lipton's *Shamrock IV* in the America's Cup races of 1920. When Mr. Adams assumed the secretariat, President Lowell of Harvard characterized him as "good at everything." The "everything" should be particularly applied to matters nautical, financial, congenial. The fact that he is a teetotaler, does not smoke, and is given to high stiff collars helped earn him the nicknames "Deacon" (which he likes) and "Angel" (which he doesn't), but did not prevent him from being the most popular member of Harvard '88 and its president throughout his course. During his thirty years as Harvard's treasurer, the University's investments increased from some $10,000,000 to about $110,000,000. He is presumably the wealthiest of the living Adamses; his fortune is estimated as close to a million dollars. When he entered the Cabinet he resigned directorships in some thirty-five corporations, including American Sugar Refining Co., A. T. & T., Bigelow-Hartford Carpet Co., John Hancock Mutual Life Insurance Co., Lee Higginson Trust Co., Old Colony Trust Co., Amoskeag Co. Upon his arrival in Washington he was faced by a battery of cameramen demanding that he pose at the secretarial desk, writing. He did so, wrote, "This is hell, this is hell, this is hell . . ." He began sailing at ten, is still navigating at sixty-odd, and has brought up his son, Charles Francis Jr., now Harvard 1932, in the same healthy tradition. In 1891 he coached a Harvard crew which beat Yale. A stickler for shipboard discipline, he is extremely casual in nautical dress. An elegantly attired regatta committee was once appalled to discover Mr. Adams tuning up the *Resolute* while wearing a derby. "Pardon me," he remarked, "I will retire for a few moments and return, dressed for the occasion." He is not much of a speech-maker, but has a dry, succinct wit. On his way home from the London naval conference he was invited to act as helmsman of the 59,000 ton *Leviathan*. Relinquishing the wheel after twenty-five minutes, he observed: "She's a bit lively." Mrs. Adams is the former Frances Lovering, daughter of a late cotton mill owner and Congressman of Taunton, Massachusetts. In Washington she is much occupied with a rock garden; in Boston with the Pottery Club, whose matron members are instructed in moulding, glazing, *et al.* Although too poor a sailor to accompany him, she follows her husband's voyagings through field glasses. Whenever possible during weekends she plays tennis with him.

WHILE he lived in Boston, the Secretary of the Navy was constantly receiving written requests for free passes to hockey games and was once routed out of bed in the dead of night by a long distance telephone call demanding that he rescue a hockey player whose highjinks had landed him in a Montreal jail. This was due to the fact that the president of the Boston Bruins hockey team is one Charles Francis ("Pop" or "Big Boy") Adams, fifty-three, who is continually being confused with Deacon Adams. Pop Adams claims to be an eighth cousin of the Deacon through Edward, son of Henry of Braintree. The Deacon has never publicly denied the claim. He and Pop have never met, but they are both very polite about the bother they cause each other. Pop

Blank-Stoller
CHARLES FRÂNCIS ("POP") ADAMS

is frequently asked for investment and genealogical advice and received numerous congratulations when the Deacon became Secretary of the Navy. Besides his hockey interest (which is his hobby as well as part of his livelihood), Pop Adams is vice president of the Boston Braves baseball team and a director of several organizations including First National Stores, Waldorf System, Inc. (restaurants), the Legal Stamp Co., and the Old Trusty Dog Food Co. He was born in Newport, Vermont, works in Boston between a big photograph of Theodore Roosevelt and a copy of the Declaration of Independence, and lives in pastoral Framingham. There Mrs. Adams (Lillias Mae Wollard of Ontario) pursues her fancy for harness-racing, owning a dozen blooded steeds, among which is *Better Win*, who holds world's records for a pacing colt on a half-mile track. Pop's features are not unlike those of the Secretary of the Navy; his secondary nickname, "Big Boy," is the best key to the physical difference between them.

Underwood & Underwood
CHARLES LANGDON ADAMS

CHARLES LANGDON ADAMS, forty-four, of Pelham Manor, New York, characterizes himself and his wife as "not particularly interesting people." Interesting or not, they typify the numerous if unpublicized solid citizenry of the Adams family. Mr. Adams left school at eighteen and entered his father's business, of which he is now president—Cross, Austin & Ireland Lumber Co. of Brooklyn. In the winter Mr. and Mrs. Adams play a good deal of bridge. In the summer Mr. Adams repairs to Montana for riding, fishing, and hunting. He has a small son and daughter.

SAMUEL HOPKINS ADAMS began writing while still at Hamilton College. But not until he was fifty-five did his career reach its climax. Republicans from Spokane to Philadelphia shuddered at the picture of the Harding administration drawn by Mr. Adams in *Revelry*. Blond, of great energy, he is the typical Nordic with the Nordic's love of a fight. Through magazine articles he led a crusade against fraudulent advertising practices so successfully that the American Medical Association rewarded him with an associate membership.

P. & A.
SAMUEL HOPKINS ADAMS

International
EDWARD DEAN ADAMS AND FRIENDS
(LEFT) DR. NICHOLAS MURRAY BUTLER (RIGHT) PROF. F. W. J. HEUSER

IF THE Secretary of the Navy be the richest living Adams, the most venerable is surely Edward Dean Adams, eighty-four, of New York and Rumson, New Jersey. Descending like his distant cousin Evangeline from John Adams of Menotomy (son of Henry of Braintree), he is white and bent but talkatively *au courant* with business, scientific, and artistic affairs. His den, clustered with snapshots of grandchildren, family portraits, trinkets, genealogies, books of his own authorship, is a little museum of his past and his legacies, vital and intellectual, to the future. Born in Boston, he attended Norwich University and M. I. T. As a partner in Winslow, Lanier & Co., New York bankers, he organized the Northern Pacific Terminal Co. (president 1882-86), St. Paul & Northern Pacific Railroad Co. (vice president 1883-87), New Jersey Junction Railroad Co. He reorganized the Central Railroad Co. of New Jersey. In 1893 he resigned his banking affiliation to devote himself to corporate work on his own account. At the time he was reorganizing and financing the nearly bankrupt American Cotton Oil Trust (board chairman 1890-96), and was president (1890-99) of the Cataract Construction Co., which under his direction accomplished the great power installation at Niagara Falls, an unprecedented engineering feat. Simultaneously he was reorganizing the Northern Pacific Railroad (board chairman 1896-97) involving $300,000,000, and was representing the Deutsche Bank of Berlin in the U. S. (1893-1914). In 1896 he floated a $100,000,000 gold loan to the U. S., subscribing to one-fourth of it for the Deutsche Bank, which averted an American panic. His diverse predilections have caused him to be trustee, fellow, patron, or life member of more than forty cultural and scientific bodies, among them the Metropolitan Museum of Art and the American Association for the Advancement of Science (trusteeships). In 1920 he retired from active business; in 1925 Mr. Adams was banqueted at the Waldorf-Astoria. Among those who signed a *Friendship Volume* were George F. Baker, Nicholas Murray Butler, Robert W. DeForest, Thomas A. Edison, Cass Gilbert, Frederick W. MacMonnies, Samuel Insull, Charles M. Schwab. Said Mr. Edison: "Thanks to Adams and other optimists, the great curve showing the rise in wealth and progress of the U. S. constantly points upward at an angle of twenty degrees, full of saw teeth, but it always ends a little bit higher."

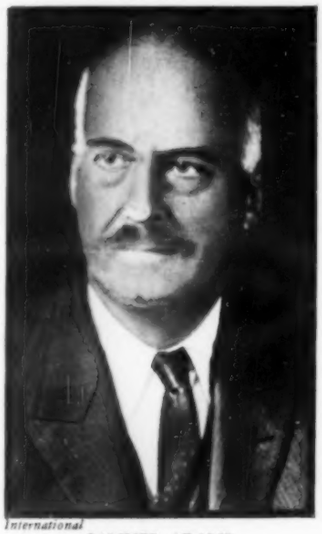
HENRY ADAMS

ROBERT C. ADAMS

ROBERT C. ADAMS of New York, vice president and director of Bancamerica-Blair Corp., is one of the most distant and unusual relatives of the Presidential Adamses. Stemming from an uncle of Henry of Braintree, he is a self-made man. He was born fifty-seven years ago in Scranton, Pennsylvania. By virtue of astonishing mathematical talent, he rose from office boy at thirteen to secretary at fifteen of the Scranton Passenger Railroad Co. At twenty-three he was treasurer and director of the $10,000,000 Spring Brook Water Supply Co. and began collecting paintings (ultimately work by Inness, Manet, Boardman Robinson). Says he: "I am only interested in modern stuff. I suppose that is perfectly logical since I had so little education. I am interested in the age we live in because that is the age I know about." As a young man he also studied the cello and the French tongue, spent his vacations with an artist and daubed "for my own amazement." At twenty-five he helped form a Scranton symphony, playing the cello, "and damned badly, too." Later he married Kate Sherwood, daughter of a coal operator, and moved to New York. They have one son.

HENRY ADAMS, bachelor of Boston, is the son of the late railroadman, Charles Francis Adams. Meticulous, slow-going, he is a family trustee like his cousin Arthur, with whom he shares an outmoded State Street office. From its windows he may observe a brass marker on the sidewalk below, denoting the location of the Boston massacre, a reminder that his great-great-grandfather John Adams, sage and cool while all Boston was afire, undertook the defense of the British officer involved and had him acquitted. Henry's particular charges are Adams properties in Spokane, Washington, and a development site in Lewiston, Idaho. He is the family genealogist.

SOME thirty-six years ago a young Chicago lawyer named Samuel Adams began to pay court to Louise Koerner, descendant of the first governor of Illinois. Her father asked his friend, the late Judge Elbert H. Gary, about the young man's reputation. Judge Gary replied: "Yes, I know Samuel Adams quite well. He is one of the most brilliant and cockiest lawyers in town." At the age of twenty-two, Samuel Adams refused the deanship of law at the University of Illinois because Louise Koerner did not wish to live in a small town. Now, at fifty-eight, he is among Chicago's outstanding practitioners (Adams & Hawley), specializing in constitutional law.



International
SAMUEL ADAMS

Still hard-driving, aggressive, he looks like an elderly military man, is locally noted for his memory. He plays contract bridge and tennis, drives his Stutz very rapidly, joins his wife and their friends in weekly meetings at which old and new plays are read aloud, each person present being assigned a part. When his son, Charles True Adams, was a law student at Northwestern he heard Dean Wigmore declare in a lecture: "I believe that Samuel Adams is one of the greatest legal minds of modern times." Chicagoans have seen Mr. Adams overwhelm legal opponents, win a case with quotations from *The Hunting of the Snark* and *Alice in Wonderland*. He was Assistant Secretary of the Interior under President Taft. He is descended from Henry of Braintree through his son Joseph, and was born in Syracuse, whither Mr. Adams's mother had gone to stay after her home had been gutted by the Chicago fire.

Nickolas Muray
EVANGELINE ADAMS (MRS. GEORGE EDWIN JORDAN)

AT HER office in Carnegie Hall, Evangeline Adams and more than a dozen assistants dispense mail order horoscopes at $10, personal astrological interviews at $20, regular planetary reports at $20 a year, Miss Adams's textbooks on the stars at $3.00. In the past twenty years she has cast about 250,000 horoscopes and given endless advice on questions of the body, soul, and coin of the realm. She utilizes forty-four radio stations; by clipping certain Forhan's tooth paste coupons you may get an Adams horoscope free. Her annual income is estimated at not less than $50,000. Of the other Adamses she says: "They opposed my connection with astrology by every means within their power." The Presidential Adamses may console themselves with the thought that she is not in their line, although she *is* descended from Henry of Braintree. Short, stout, bobbed and gray of hair, she was born in Jersey City, New Jersey, and studied the welkin early under the tutelage of one J. Heber Smith, physician and astral amateur. In Boston she pursued palmistry with the late great Cheiro, but abandoned it as less exact than astrology. She lays claim to no psychic performance, merely the application of definite laws of influence. She records that she assisted the late John Pierpont Morgan in his financial dealings, prophesied the deaths of Enrico Caruso and Edward VII, the great Windsor Hotel fire, the outcome of the Tunney-Dempsey fights (she would not spoil the bouts, however, by making her deductions public). Among her past and present clients she names such diverse celebrities as Tallulah Bankhead, John Burroughs, Cardinal Gibbons (his horoscope resembles the late Houdini's), and the late O. M. Hanscom, whose connection with Miss Adams presumably faciliated his work as head of the Pinkerton Detective Agency. Some years ago, having refused offers of marriage from Sir Franklin Simmons, British sculptor, and one Mr. Lord of Boston, neither of whose horoscopes jibed with her own, she arranged to meet a certain George Edwin Jordan, whose birth had occurred beneath more propitious skies. The sequel has been a happy marriage. Mr. Jordan, a large, suave gentleman given to checked suits and diamond tie pins, is perhaps fifteen years younger than his wife. He is a promoter of parts. And although his name is never mentioned in connection with Adams astrology, there are those who think that his wife's bureau, receiving from 4,000 to 5,000 letters a day, is his biggest promotion to date. The symbolic elephant decorates his Carnegie Hall office.

ARTHUR ADAMS

LOUISA CATHERINE ADAMS is the wife of the eminent T. N. Perkins, Boston lawyer, reparations committeeman, and great friend of Owen D. Young. Because she is deaf, Mrs. Perkins misses the slang which her husband employs with such virtuosity that the late President Eliot, at a meeting of the Fellows, once requested: "Will some one kindly translate Mr. Perkins' remarks into English so that I may understand them?"

International
THOMAS NELSON PERKINS

ARTHUR ADAMS, breezy brother of the Secretary of the Navy, announces his occupation as class secretary of Harvard '99. But he really has more to do than this would indicate. He is a trustee of the Adams family estates and an astute investor: his fortune is ranked with that of his brother. Active in social work, he is president of the Boston Children's Aid Society and is variously connected with the Boston Society for the Care of Girls, the Family Welfare Society, the Sailors' Snug Harbor of Boston, and the Farm and Trades School on Thompson's Island, Boston Harbor. The boys of the last institution, always 100 in number, knew him for years as the false-bearded Santa Claus who visited them each Christmas with innumerable gifts bought with his own money. He could call more nicknames than the superintendent himself. Just after the War he married Mrs. Francis W. Sargent Jr., a widow with two children, daughter of the elderly George Lee of Boston, president of the Etna Lead & Zinc Co. She has borne two children to Mr. Adams. Less celebrated as such than his brother, Arthur Adams is none the less considerable of a tar. Most of his spare moments he spends on the water. For a long time he and the Deacon gave each of their boats a name with a double *o*. Between them they had the *Papoose*, *Baboon*, *Gossoon*, *Harpoon*, *Rooster*, *Crooner*.

A Prince's Favorite and Lord Kitchener of Khartoum

SINGAPORE

DUTCH EAST INDIES

TURKEY

JAPAN

JAPAN

PERU

MEXICO

ECUADOR

ENGLAND

JAPAN

INTERNATIONAL

ETHIOPIA

ENGLAND

ENGLAND

IMPERIAL RUSSIA

AFRICA

A NOT unnatural development of a philatelist's album would be the collection presented herewith. Nor would the collector of match boxes have an easy time gathering them. He might well have to travel to Siam or Madagascar, for there is no one spot where he could find them all. He would have to beware of innumerable imitations; he might get in trouble with governments and churches. After he had collected the 12,000 manufactured by the Swedish Match Company and its allies, and others made by Japanese and Mexican companies, he might, if he wished, start assembling the small books of matches widely used in the U. S. as an advertising medium. But it is doubtful whether his collection would ever be complete. The 500 boxes used in Japan are themselves an initial challenge.

It is of interest to the International Match Corporation to remain on good terms with the various governments which it has financed and which in turn have given it match monopolies. It is also of interest to it to remain on good terms with governments which it has never financed and where it has no monopoly although it is permitted to sell matches. No more charming way of keeping one's international frontiers all quiet and content could be discovered than the creation of the gay little covers pictured above.

Help Keep International's Far-Flung Fences in Repair

MEXICO

DUTCH EAST INDIES

JAPAN

MEXICO

FRANCE

VENEZUELA

JAPAN

ENGLAND

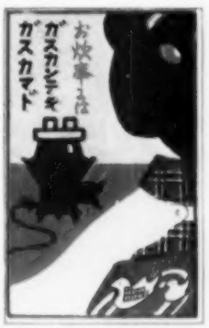
DUTCH EAST INDIES

FRANCE

JAPAN

JAPAN

INDIA



JAPAN

EUROPE

For governments are occasionally quite sensitive about the covers which appear on match boxes. There is the story of an African prince who asked that the picture of his favorite mistress appear on the match boxes of his principality. The International Match Corporation thought, however, that the effect might be demoralizing to certain of the young girls who worked in the match factory. A compromise was reached, and the prince finally declared himself satisfied with only the head and bust of his smiling Ethiop favorite, whose charm is readily apparent on the opposite page.

Occasionally the covers are topical, like the Motor Girl or the picture of Lord Kitchener. Occasionally they are illogical like the cover, widely sold in China, reproducing the coat of arms of the Isle of Man (the three legs), or El Condor, sold in Ecuador although the condor is the national bird of Chile. Occasionally they are apologetic like the War Quality cover, which explained the temporary inferiority of the matches.

The Catholic Church had occasion to object to the picture of the Virgin of Guadalupe. The matches contained in the box made by a Mexican company were waxen, and it was a custom after one had

[*Continued on page 102*]

From Currency to Commodity

Is the downward path silver is taking these days. Single-handed, Chimanram Motilal cornered the Bombay market last winter. But his feat was insignificant viewed against its background: the lowest prices for silver in recorded history, the final decline and fall of what was once gold's partner, the buying power of 500,000,000 people cut in half.

CHIMANRAM MOTILAL is a Marwari Hindu, and exceptionally honest for a Marwari. He is one of the two men who have cornered the Bombay bullion exchange, which takes the place of the stock market in Indian economic life. The other man was Chunilal Saraya, ambitious and daring head of the Indian Specie Bank, who began a campaign in 1910 to corner the *world* silver market. For three years he accumulated silver, engineering several profitable corners for delivery on the Bombay market during the period. Disaster finally overtook him, and his bank closed its doors with $15,000,000 worth of silver still on its books.

Mr. Motilal, so far as is known, has no ambition to corner the world supply of silver. He seems quite content with his little *coup* last January on the Bombay market. The situation was tempting. Prices had been sharply depressed for several weeks, and many a shrewd bullion broker was selling short in the expectation of still lower prices. This expectation was correct: silver was destined to go considerably lower. What the smart brokers did not foresee was a sudden and disconcerting leap in prices that was to interrupt this downward progress. They did not realize that the same individual was the buyer in most of their short sales, that old Chimanram Motilal was risking his fortune of 40,000,000 rupees (about $14,600,000) to corner the market. For half a week he bought—2,000,000 ounces of spot at forty-three and seven-eighths cents, and 4,000,000 ounces of futures, more silver than could be found in the entire Bombay market. Such quantities of silver had to be imported from London, Shanghai, and other markets. But it takes time to import, as Mr. Motilal well knew. Unhampered by any polite New York Stock Exchange rules as to the treatment of shorts, he took full advantage of his corner, squeezed the unhappy short interest in every manner his ingenuity could devise.

Mr. Motilal's operations in the silver market have been uniformly successful, except for a certain little business at Nagpur some years ago about which he does not care to talk. He does not consider silver's immediate future encouraging, and he has gone so far as to predict that silver will probably reach the level of baser metals. In person, he is a fine-looking man of sixty-seven, of a rather serious turn of mind. Though he has had no formal education, he speaks Hindustani, Bengali, Gujarati, and Marathi. He has never been outside of India, which may or may not have something to do with the fact that he is an ardent supporter of Gandhi. His usual costume is based on a pink silk puggree wound about his head and a white loin cloth. He carries a gold-banded Malacca cane and wears no socks. When he draws up to the exchange in his Cadillac, the brokers, in wrinkled white duck suits, stop their bargaining to look at the old man who was once their master and may be so again. But Chimanram Motilal—Cadillac, cane, loin cloth and all—is dwarfed to a mote by the implications of what is happening today in silver.

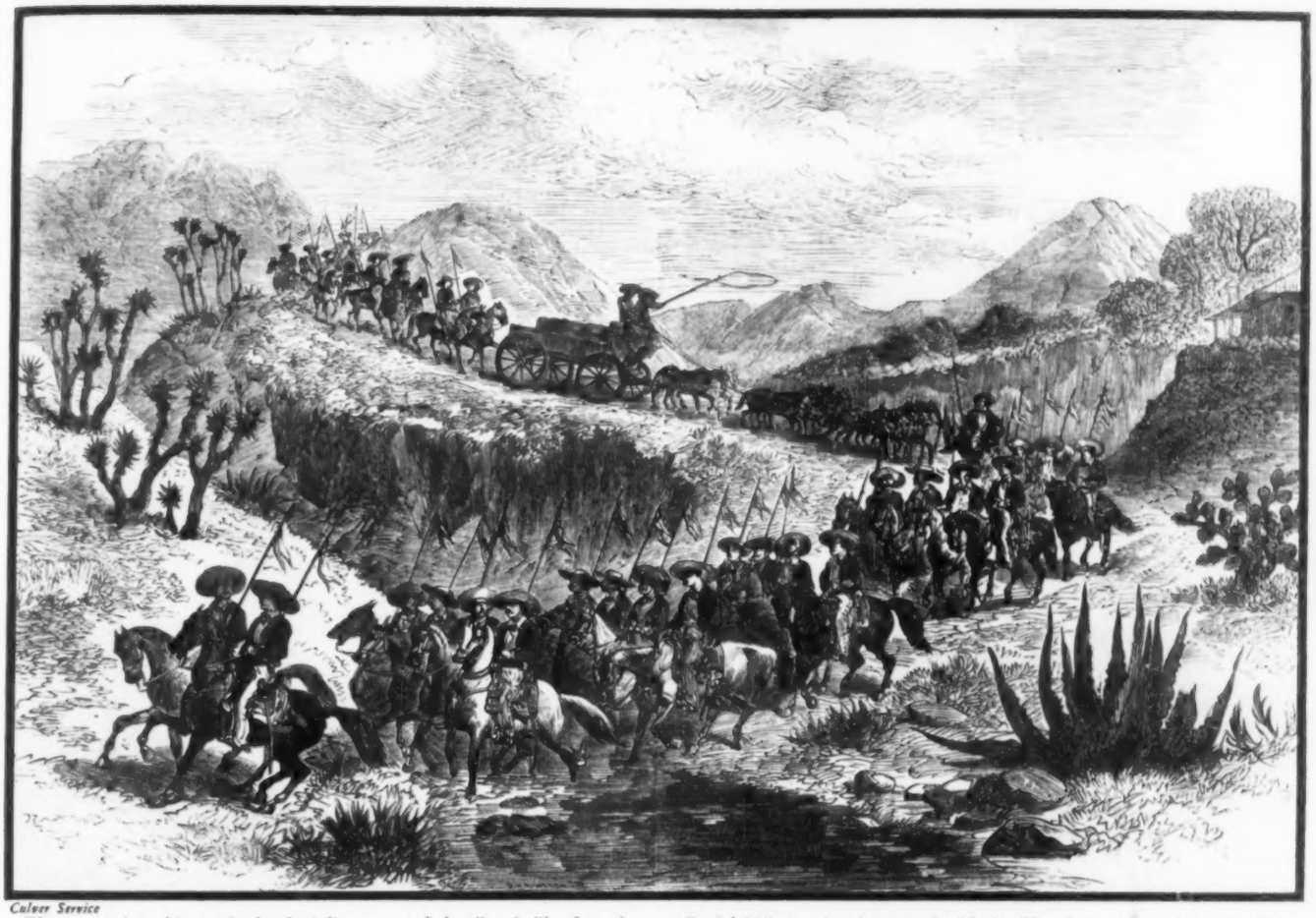
On June 21, 1930, silver sold at thirty-three and one-quarter cents an ounce, a quotation lower than any previously recorded in the history of mankind. This was the lowest point of a steady decline that began in May, 1928. How great has been silver's fall appears from the fact that in the time of Alexander the Great ten ounces of silver were worth one ounce of gold, while today the ratio is over fifty to one. As silver dropped lower and lower this summer, making many new all-time lows on the way to thirty-three and one-quarter cents, people began to realize what economists have long accepted as a truism: that silver is no longer on the same plane as gold, that it is rather a commodity like rubber, wheat, or copper.

Relative, not absolute

There are many commodities. There is only one currency, for Western nations at least, and that is gold. The "price" of gold is the same in London as it is in New York, the same today as it was yesterday and will be tomorrow. Take an ounce of gold to the Treasury at Washington and you will receive $20.67 for it. The Royal Mint or the Bank of France will give you exactly the same price for your gold. Anywhere, at any time, an ounce of gold is worth $20.67, or rather it *is* $20.67. For gold is not valued; it itself is value. It is not bought; it buys. Time was when silver was the same, when a pound sterling meant a pound of silver and not 7.322 grains of gold. But silver has fallen from its high estate: its price is not absolute but relative to the absolute. Only gold, in the new economics, remains absolute.

As a commodity, silver is bought and sold. Its price goes up or down in sympathy with other commodity prices. But silver's actions as a commodity are complicated by the fact that it was not so long ago used as currency everywhere and that it is still so used by half the population of the globe. When one looks for the causes of silver's contemporary decline, it appears at first glance that supply has not increased nor demand decreased. India and China continue to absorb three-quarters of the world's annual production. Nor has production risen appreciably: in 1913 it was 223,000,000 ounces; 1925: 252,000,000 ounces; 1929: 256,000,000 ounces. It is true that this production cannot easily be reduced because of the unhappy fact that most of the world's silver is now produced as a by-product from the mining of other metals. But production is certainly not increasing fast enough to cause any decline in prices.

The disaster that has overtaken silver of late is intimately,



Culver Service

Time was when this cavalcade of *caballeros* escorted the silver bullion from the great Real del Monte mines into near-by Mexico City. Among silver consumers China and India are preëminent; among silver producers, Mexico. Most Mexican silver is obtained from silver mines, which is only noteworthy because most of the world's silver is not. Like many another Mexican silver mine, Real del Monte is at present shut down. This does not mean, however, as has been assumed more than once, that Mexico is cutting down on her silver production. The fact is that the companies are merely concentrating on their more productive mines, from which they are taking out more metal than ever. The monthly average of Mexican production is about the same so far this year as last.

intricately, and inextricably bound up with the complex business of currency. So infinite are the ramifications of this business that the space allowable for a magazine article permits little more than their statement. No two economists will agree upon the relative weight to be attached to the incidents of past and present currency history. And while the immediate background of the silver situation can be placed within the last few years, its ultimate antecedents are to be found at the beginning of trade.

By 1900 the currency of practically every important occidental nation was on a gold basis, and silver had become merely a commodity used in currency, not currency itself. Today, silver is scarcely that. In 1920 the United Kingdom began to debase its silver currency, which means that the mint reduced the quantity of silver in shillings and other coins from more than 90 per cent to exactly one-half. France and Belgium followed suit in the next year. Coming at a time when silver, in sympathy with its fellow commodities, was slipping rapidly downhill from War prices, these acts turned silver's retreat into a rout. Not only was much less silver needed for new currency, but also the debasing of already existing coinage threw great quantities of silver on the market. Even more important has been the Indian government's constant selling of its silver stocks, of which more later. From these sources 105,000,000 ounces were added to the world supply during 1928 and 1929. Debasing of currency, selling of governmental stocks—these are some particular factors in silver's decline. More general causes are, first, that other commodities have been steadily falling and, second, that the two principal consumers of silver are experiencing hard times.

For half the population of the globe, silver has become a commodity. For the other half, who live in China and India, it has largely kept its status as currency. In the Far East, then, whose economics are still based on silver and which absorbs 75 per cent of the world production of the metal, lies the crux of the silver situation. The trade balances of India and China are probably the most important primary influences on silver prices. When they are swelled by prosperity, the West can dispose of more of its silver (over 75 per cent of the world's production is mined in North America), and silver prices rise. When the East is ravaged by war and famine, it can absorb less of the West's silver, and prices fall. On the other hand, oriental trade balances themselves are greatly affected by the price of silver—though here a most important distinction must be drawn. India is officially on the gold standard, which means among other things that she settles her international trade balances in gold. Hence the fluctuations of silver, theoretically, do not affect her buying

power. But the masses of her people still regard silver as the basis of value and have accumulated vast hoards of that metal. Until these accumulations cease, the real buying power of the Indian people will depend somewhat on silver prices. China is the great sufferer from any decline in silver prices, however, for China is, both officially and unofficially, on the silver standard. In addition to the usual fluctuations in a nation's currency, China is further embarrassed by a fluctuation in the value of the metal on which her currency is based, so that the state of the silver market determines how much the Chinese merchant must pay for the Lancashire cotton cloth or the Pacific Coast flour he imports. The current decline in silver, which found prices around seventy cents per ounce and has reduced them to about thirty-five cents, might be said to have cut in half the buying power of China's 500,000,000 inhabitants as far as world trade is concerned. Actually, this is only one of the factors which have curtailed Chinese purchasing power. Had political conditions allowed a normal trade in silk, for example, China would have been able to pay for more imports.

Silver in India

If every person in India bought an ounce of silver every year, the price of silver would soar. For there are 320,000,000 people in India, as against a world output last year of 311,000,000 ounces of silver. Every one in India would undoubtedly like to buy an ounce of silver (or more) *per annum*, for every one in India is as excessively fond of silver as Chimanram Motilal showed himself to be last January. They are so fond of silver that they wrap it around their sweetmeat *pan soopari* and eat both candy and wrapper with relish. The dusky limbs of many an Indian woman are encircled with countless tinkling silver ornaments, anywhere up to ten pounds of them to each female. If family reverses come, silver is so universally admired and desired in the land that the wife becomes a walking bank account. She was literally so in India's days of free silver: her husband shipped the jewelery to the government mint and received in exchange as many bright new rupees as could be coined out of it.

But the British Raj closed the mint to free coinage of silver in 1893. And in 1926, on the recommendation of a Royal Commission, India's currency was put on a gold basis, which meant the demonetization of a monetary stock estimated at over $1,670,000,000. Ever since that time the government has been endeavoring to sell its vast stocks of silver and replace them with gold reserves. The process is not over: last year 35,000,000 ounces were thus sold. This year the government has refrained from such quantity selling (though a private sale of 15,000,000 ounces to the Hongkong Government was recently reported), and it may be that its great stocks will not reach the market for some time. The most severe blow at silver so far this year, and what is probably as responsible as any one factor for the recent succession of record lows, was the import duty of approximately ten cents an ounce decreed by the Indian Government last February. This move, which drove silver sharply down, obviously aims to keep as much silver as possible out of India. The country, indeed, seems to be saturated with the metal. In spite of the huge sales last year, the government stocks of silver have actually increased. However much the government may insist on the gold standard, the every-day business of India is still reckoned in silver and it is silver, not gold, that is paid into the banks in exchange for the new paper currency. Among all the conflicts of East and West which are tearing modern India none is more clearly defined than this attempt to enforce a gold standard on a people who think in terms of silver.

And in China

The Chinese are too sophisticated a people to hang silver bangles on their women. They import a great deal more silver than any other nation, and practically all of it goes into currency. Much of it, indeed, is imported as currency: the Mexican dollar is one of the most universally used Chinese coins. With India being prodded along toward a gold standard by the British, China shares with Abyssinia the lonely distinction of cleaving to the silver standard. It inevitably looms largest in any speculations as to the future of silver. After a year's study of Chinese currency problems, the Commission headed by Dr. Edwin W. Kemmerer, who is now occupied in extricating Colombia from its financial difficulties, has recommended to the government that a gold standard be adopted. Chinese economic opinion would seem to favor the gold standard. "So long as China remains on a silver basis," trenchantly declares Chang Kia-Ngau, general manager of the Bank of China, "she will be the sole victim of the violent fluctuations in the price of silver." Fortunately for the silver market if not for China, the Kemmerer Plan is at most a possibility. It proposes a currency of debased silver backed up by a gold bullion reserve, both of which are at present out of the question. The credit of the Nationalist Government is much too shaky for debased coinage to pass current among the people, nor is China in any position to build up a gold reserve.

Though China consumed more silver than ever last year, 136,700,000 ounces, even her voracious appetite for the metal is approaching satiety. Silver stocks at Shanghai, trade and banking focus of the country, have steadily risen from 147,195,000 ounces on January 1, 1929, to 192,388,000 ounces a year later and finally to the crushing total of 226,116,000 ounces at the end of last July. Though the civil wars are drawing some silver into the interior for the payment of troops, they are scaring much more into Shanghai for safekeeping. Last January a *Times* correspondent estimated that the banks in the International Settlement had lying idle in their vaults $200,000,000 in silver, most of which in normal times would be circulating in trade throughout the Yangtze River basin. Silver quotations are headline news in China. Merchants are refusing shipments, banks are closing, all because of silver. The government is worried about its heavy international obligations, which must be paid in gold. As a disrupter of trade many importers place cheap silver even before the unsettled political outlook, a view with which Minister of Finance, T. V. Soong, does not agree. Though he admits that the currency situation is "very serious," he adds: "If China can enjoy peace, allowing trade to flourish, the dollar crisis will disappear. But if more wars arise, the future is obscure."

Obscure, too, is the future of silver, perhaps happily so. The darkest clouds on the horizon are the huge masses of silver, considerably more than two years' production, with which the Shanghai market and the Indian Government are now burdened. These stocks must be disposed of sooner or later. Production does not offer much prospect either way: last June it was about the same as in June, 1929. The most hopeful item of silver news for the future, barring a possible return of peace and plenty to China, is the recent report that France is to replace its paper five, ten, and twenty franc notes with silver coins. Since these are to be issued up to 3,000,000,000 francs worth, considerable quantities of silver will be needed. Now is certainly the time for France shrewdly to buy back at much lower rates some silver she has been selling from her debased coinage.

There Are No Automobiles

The explanation of this paradox involves the passing of the horseless carriage. What Messrs. Zeder, Skelton, Breer, and other automotive engineers are thinking about.

A CLOSET full of electric horns squawking like a lot of furious mechanical infants until they are all squawked out. A machine patiently brushing a piece of fabric until it is worn threadbare. A dazzling light shining on another piece of fabric until it fades.

Sights and sounds like these are familiar in Chrysler Corporation's five-story engineering building in Detroit, over which reigns with formidable energy Fred M. Zeder, Chrysler's powerful vice president in charge of engineering. Foremen of machine shops or nervous exalted inventors of new devices who try to impress Mr. Zeder have long since discovered that temperamentally he is a Missourian. All material, devices, or parts which he accepts he tests and retests; in fact, he generally breaks. Flywheels offer an example. Mr. Zeder and his colleagues have a predilection for taking a flywheel and depositing it in a device covered by protective armor plate and capable of turning it 20,000 R.P.M. (few automobile motors ever turn up more than 4,500 R.P.M.). Some time before the maximum is reached, centrifugal force bursts the wheel asunder. Mr. Zeder studies the condition and nature of the breakage and draws conclusions therefrom. Conclusions which sometimes annoy the production department. Or else conclusions which Mr. Zeder does not bother to impart to anyone, but files somewhere as data to be referred to later.

Mr. Kettering of General Motors or Major Vincent of Packard apply the same treatment. The better automobile manufacturers are now thoroughly infused with the laboratory spirit. They test materials exhaustively before deciding which to use. Compact and advanced, the Chrysler laboratories serve as an excellent example. To appreciate their significance it is necessary to realize that the early development of the automobile was tentative and groping. In the beginning a rudimentary gasoline motor was rigged up to propel a buggy, the entire contraption being referred to as a horseless carriage. But it had a whip rack, just in case the motor broke down and Dobbin had to be pressed into service. For years automobile manufacture has been only a more confident extension of this early process. Body designers have retained many of the features of horse-drawn vehicles—obviously, in the sense that the formal town car or limousine suggests the victoria or landaulet; more subtly, in the sense that the general contours of the automobile, instead of being adapted to the rapid pace which is its distinctive contribution to private travel, are still vestiges of the leisurely equine era. Of this, more anon.

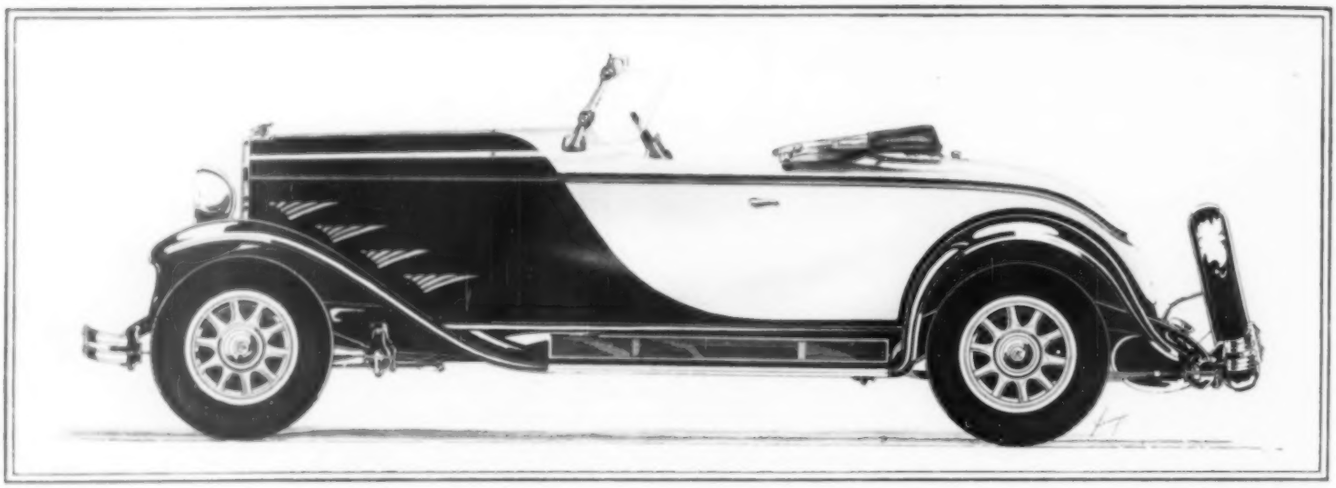
Mechanically, the progress of the automobile has also been hesitant. Any smart mechanic could contrive a gasoline engine which will work, but only an engineer could produce one whose operations are really admirable. The infancy and adolescence of the automobile were entrusted to mechanics whose care of their charge was usually desultory and sometimes approached cruelty. Occasionally someone who by academic standards was only a mechanic proved himself of high engineering calibre.

But for the most part the automobile has been in less astute hands. Mr. Zeder tells a story which exemplifies the groping methods against which his laboratory is mobilized. A firm with which he was formerly employed once devised a lubrication system which looked well on paper; no attempt was made to check it in the laboratory. When the cars were built, grave deficiencies were apparent. A simple motor, equipped with glass walls, revealed that the lubrication was a fiasco. Shortly after this, a rival manufacturer displayed his new models. When Mr. Zeder's firm tore them down for inspection, the engineers found an exact copy of their own faulty system.

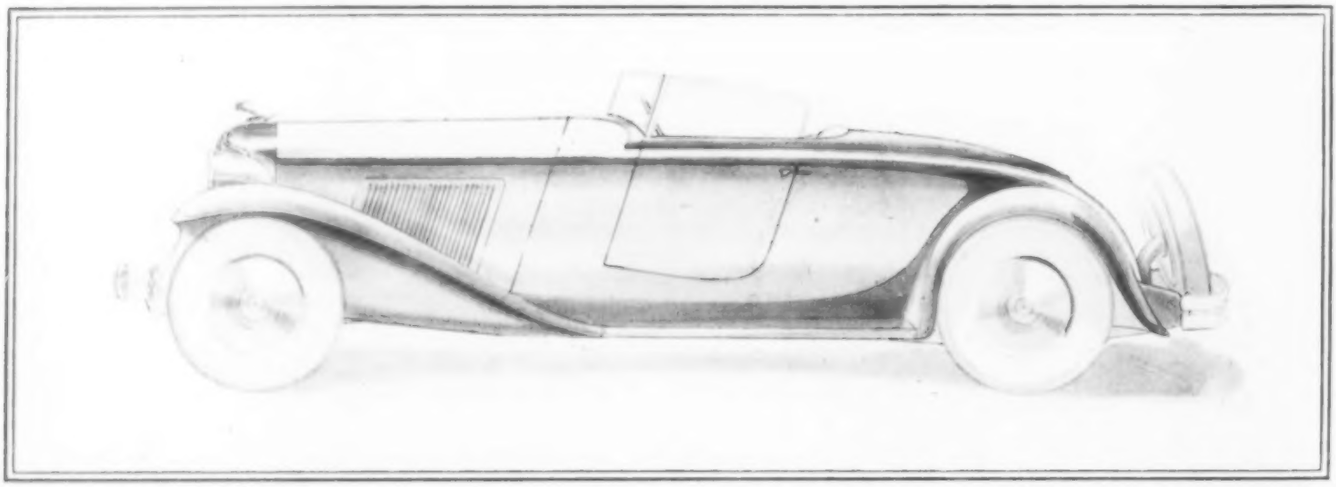
This example is by no means archaic; plenty of gullibility still exists in the automobile industry. It is a prodigious job to treat an automobile as a laboratory subject, a job possible only to the most prosperous corporations. Yet the laboratory is a necessity for any automobile manufacturer who expects to compete with the best. Chrysler Corporation's engineering plant employs some 300 skilled men and hundreds of costly devices, neither men nor machines having anything to do with the actual building of Chrysler cars. There are necessarily many college graduate engineers. The ultimately efficient automobile cannot be built without the use of such abstruse subjects as thermodynamics (science of heat) and no mere garage mechanic, be he a wizard at automobile diagnosis and repair, knows anything about thermodynamics. For that, he must go to school and keep going to school. Of Chrysler's engineering triumvirate, Vice President Zeder worked his way through the University of Michigan, his brother-in-law, Executive Engineer Carl Breer, went to Leland Stanford, and Ohio State graduated Executive Engineer Owen R. Skelton. A key to the attitude of these men is the fact that they are fond of comparing their endeavors to those of their friends, the Mayo brothers. And with truth: no Mayo investigation of the respiratory system is more searching than the delicate examinations conducted by Chrysler experts to determine the best honeycomb radiator pattern. As the Mayos study the effects of exercise on the human system, so a Chrysler chassis is studied on an apparatus nicknamed a "Belgian Road" (Belgian cobblestones are notoriously bumpy), which gives it several months of jiggling and jouncing in a few days. As the Mayos hearken to every whisper of a patient's heart, the Chryslers employ the hypersensitive oscillograph, which makes sound waves visible in light lines as they are produced, to locate the causes of such elusive annoying sounds as those produced by a motor fan. And on the hottest days of a Detroit summer it is by no means unusual to find Chrysler men, furcoated and gloved, in a room kept at below zero temperatures, working on devices to aid cold weather starting and operation.

The laboratory is the one branch of the automobile business where there is not much talk about fluctuations of trade, depressions, and inflations. In the first place its occupants, like all men of science, are seldom fired with great financial ambition. There are men in the Chrysler laboratories whose detached absorption in research undoubtedly approaches that of biologists or historians. They labor toward perfections whose approach, unlike sales statistics, cannot be stimulated or forced. Finally, they live perpetually in the future—that future toward which their experiments are tending. The early mechanic, preoccupied with his awkward makeshifts, his haste to produce a salable vehicle, had neither the time nor the scientific training to get a perspective of the automotive trend. But Mr. Zeder can make a scholarly analysis of events to date and a learned prognostication for the future of design. This ability is perhaps the chief contribution of the laboratory method to automobile history.

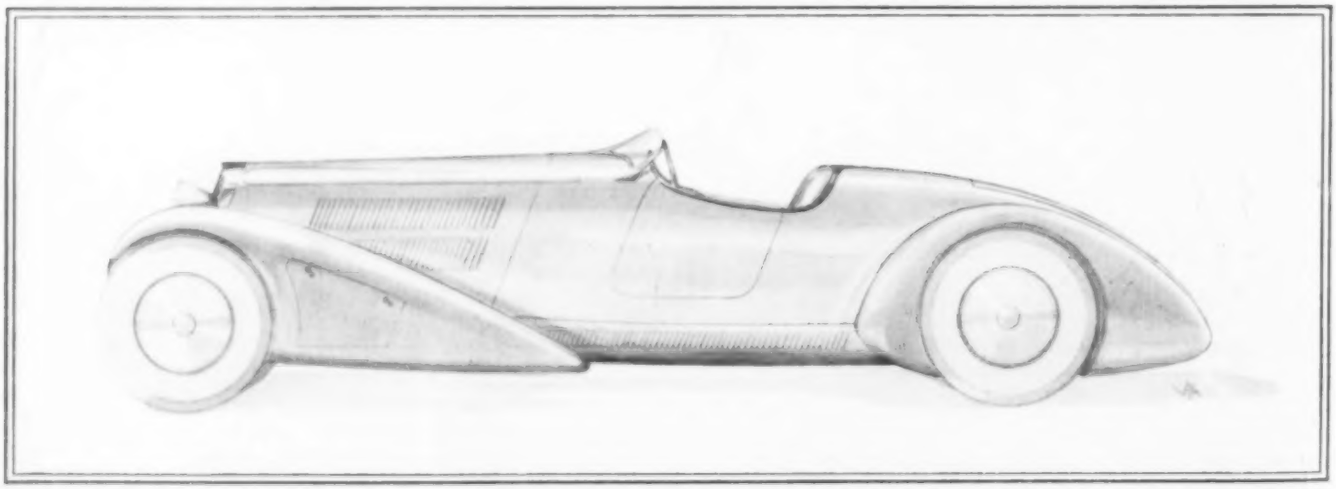
When the late Edgar Saltus was asked, "Do you think that Christianity is dying?" he is reputed to have replied: "I was not aware that it had ever been alive." Were someone to ask Fred Zeder if the automobile is dying, he might express a similar surprise to learn that it had ever existed. For by an automobile Mr. Zeder means a vehicle ideally adapted for propulsion by machinery. And vehicles of this sort are as rare as good Christians. To Mr. Zeder's foreboding, scientific eye, the present still belongs to the



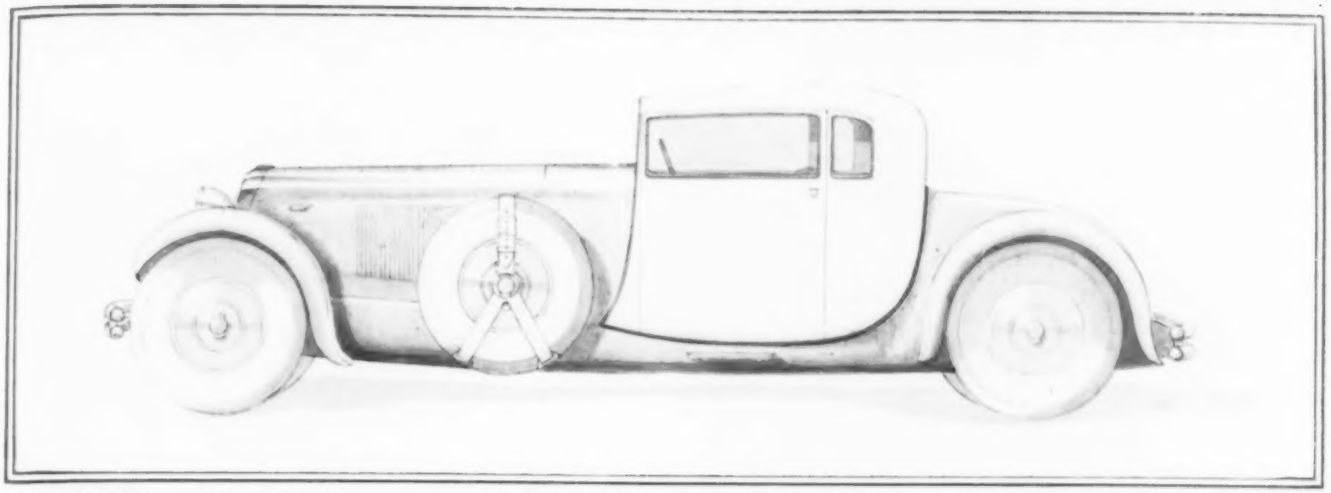
Between an old model and a new one are innumerable drafting room experiments. As the research pathologist tests varieties of medicine, so the automobile designer tests varieties of contour. Above is the old Chrysler roadster. On the bottom of the opposite page is . . .



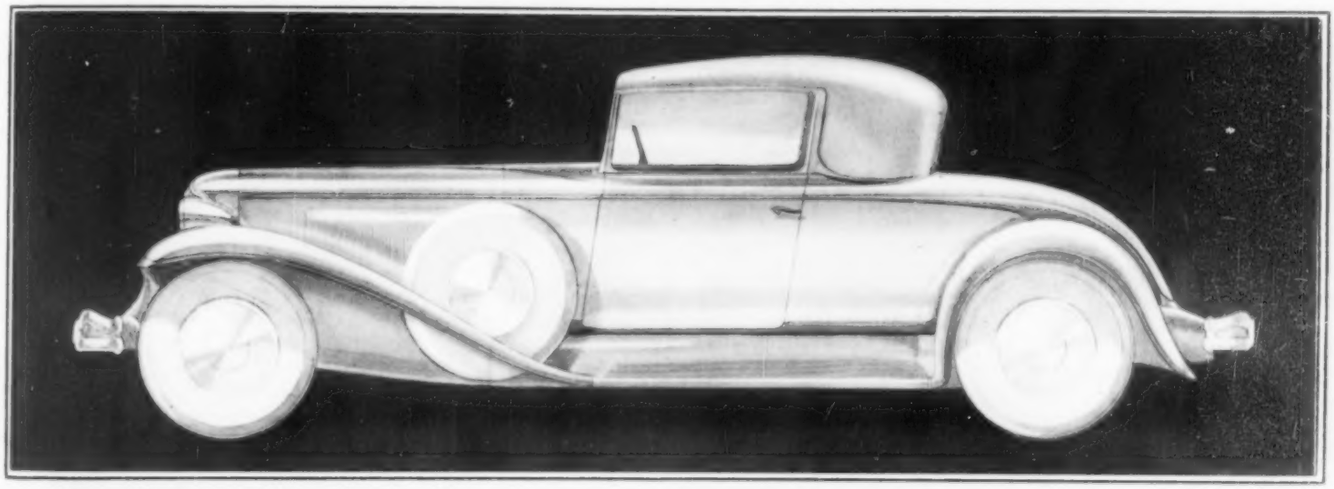
. . . the new Chrysler roadster. Between are several of the innumerable experiments. Some of them are impractical because they are too radical to suit the present public taste, others merely dissatisfy their creators, still others would require changes in manufacturing equipment which Chrysler is . . .



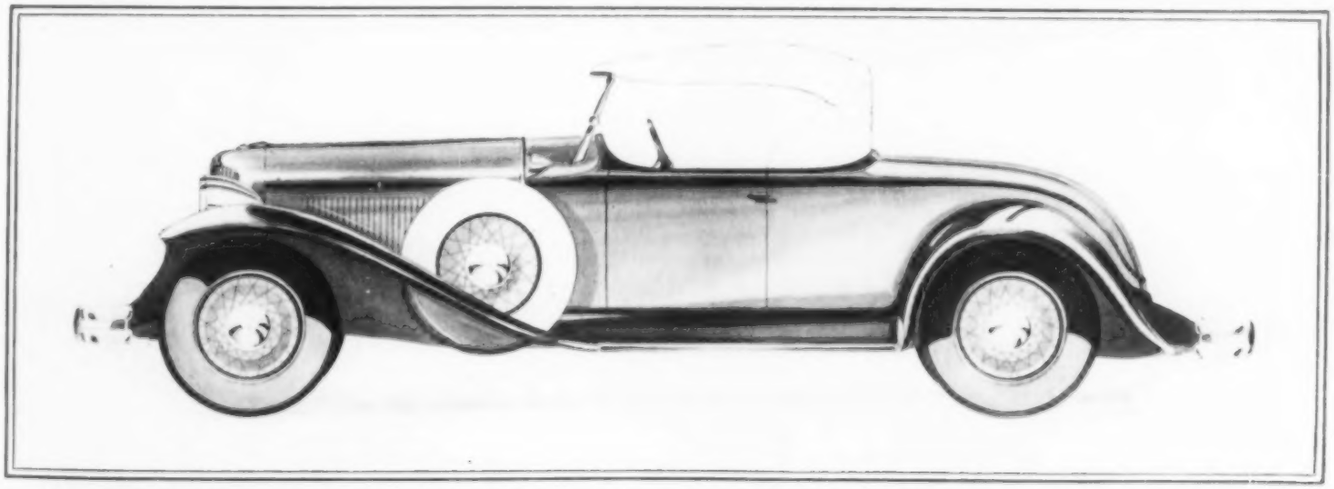
. . . at present not prepared to make. They are, however, by no means without value. Mr. H. V. Henderson, head of the Chrysler art department, directs the labors of numerous draftsmen who must be able not only to render sketches but to present them in the form of mechanical drawings.



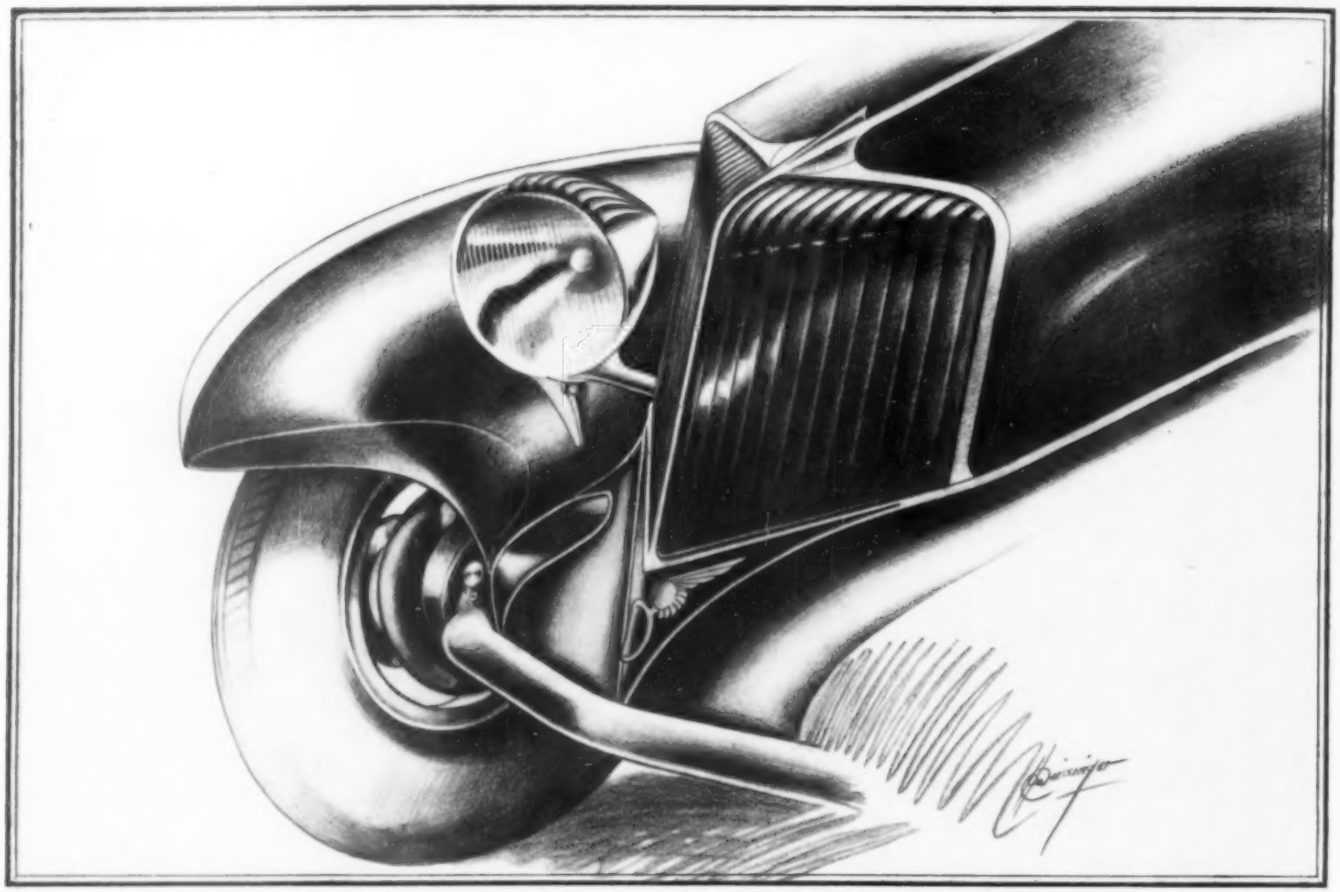
Thus Mr. Weissinger, whose radiator designs appear on a following page, is not only able to depict a wind-blown nymph for the adornment of a radiator cap but can illustrate the nymph's graces in terms which a metal worker can understand and proceed to embody in chromium-plated steel . . .



. . . The medical parallelism holds true throughout; just as one man specializes in bacteriology, another in endocrinology, another in histology, so one of Mr. Henderson's staff is an adept in the design of such details as door handles and dashboard instruments, another . . .



. . . in over-all body design, another in color application. With the increasing use of aërodynamic principles in body design, the invitation of the automobile industry to the creative designer, who must correlate art and science, should be more urgent than ever.



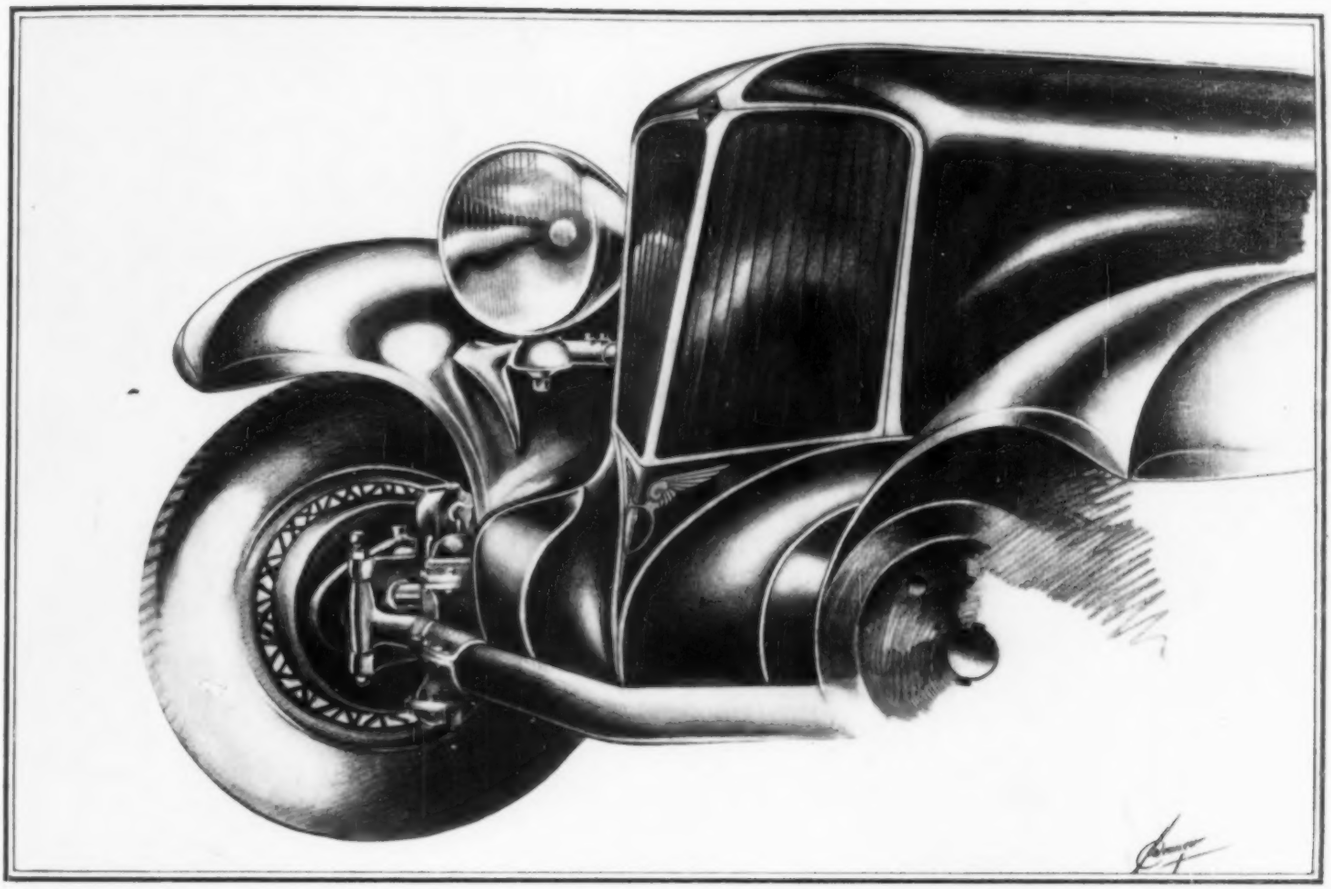
To many, the automobile may be prosaic, but men who plan them often regard them as opportunities for exciting, vital design. On these pages are drawings with the visceral quality of anatomical charts, from the vigorous pencil of Herbert Florian Weissinger of the Chrysler art department. As energetic abstractions, they might stand by themselves. Actually they are tentative suggestions, working toward a new Chrysler radiator.

horseless carriage; the automobile belongs to the future. Through his eyes it is possible to glimpse what this new vehicle, the automobile, will be like. No one can be sure, but certain generalities may be predicted. Motor car comfort has already been highly developed, although it is only reasonable to expect that the present best in roominess, ease, and convenience will gradually be exceeded. Mechanically such laboratories as Mr. Zeder's would seem to be progressing rapidly toward a point where further improvement will be appreciable only to the engineers themselves. To be sure, principles like the front drive (Cord, Ruxton) and free wheeling (Studebaker) are in their infancy. They are the most radical developments since the self-starter and perhaps highly potential. But it is unlikely that automotive mechanism will grow vastly more economical or efficient. For one thing, the average motorist demands a car which will beat his neighbor's at the traffic lights—in other words, which has power on demand. And the engineer inevitably gets power at the expense of economy. Were it not for this power craving, he could produce cars capable of economic feats as yet unknown. But he does very well as it is with economy, efficiency, comfort, and appearance. In other words, the horseless carriage has reached a splendid prime. It is quite old enough to stop being a horseless carriage and become an automobile. Therein lies the chief opportunity for the future.

Theoretically we may say that the difference between the horseless carriage and the automobile is the difference between a carriage independent of animal locomotion and a vehicle specially designed to make the most of mechanical locomotion. Actually, the motor car of today is somewhere between the two. It proceeds at a pace which would have scandalized the carriage age. It provides greater comfort at high velocities than the carriage did at its jog trot. Often sleek and trim, it makes certain attempts to express its natural pace. But it is still a job of coachwork placed upon a chassis, with little attempt at integration. And despite the fact that its fundamental problem is passage through air resistance, a problem which the leisurely carriage never encountered, it has never met this problem squarely. Mr. Zeder points out, for instance, that the car of today would be faster if designed to run backward. And in the carriage era it was logical to place the horse before the cart. In the horseless carriage era this principle persists, with the engine before the tonneau. But the automobile era threatens to change things. The automobile will essentially be a projectile. Fortunately, the experience of aviation engineers, who *had* to meet the air resistance problem, is now available to the automobile men.

The triumvirate

About the Chrysler Corporation one says Zeder, Skelton, and Breer with as much ease and familiarity as one in the clothing trade might say Hart, Schaffner, and Marx, or one on the stage think of Ethel, Lionel, and Jack. In 1921, in Newark, New Jersey, Mr. Zeder was president of the Zeder, Skelton, & Breer Engineering Corporation, which was the first public appearance of the trinity although they had previously worked together with the Studebaker organization and also with Mr. Chrysler when he was vice president of the John N. Willys interests. The Maxwell Motor Corporation (later the Chrysler Corporation) eventually took over the engineering firm, and the triumvirate passed into obscurity as far as the public was concerned although for the automotive trade their importance seemed ever to increase. Of Chrysler products which have known their engineering touch, it is sufficient to list the Chrysler, Dodge, De Soto, and Plymouth cars, the Dodge trucks and busses, the Fargo commercial cars, and the



At right and below is Mr. Weissinger's sketch of the radiator which actually appears on the new Chrysler models. Above is another of his multitudinous and arresting suggestions. The artist is twenty-two, a native of Danville, Kentucky, the son of an architect and builder. He reached Chrysler after Center College and the Washington School of Fine Arts. His work strikingly exemplifies the industrial application of the method and viewpoint of fine arts.

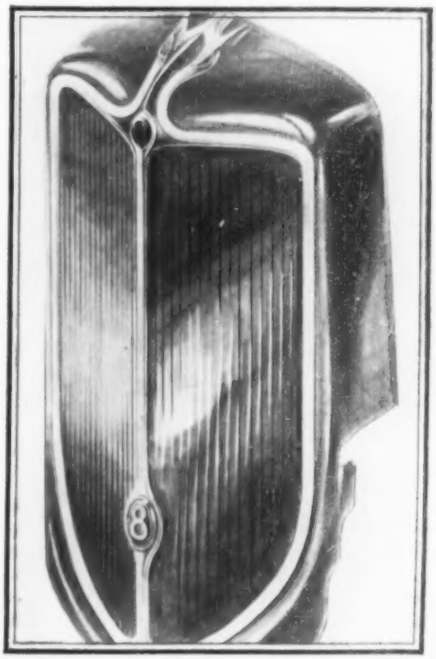
powerful, popular Chrysler marine engines.

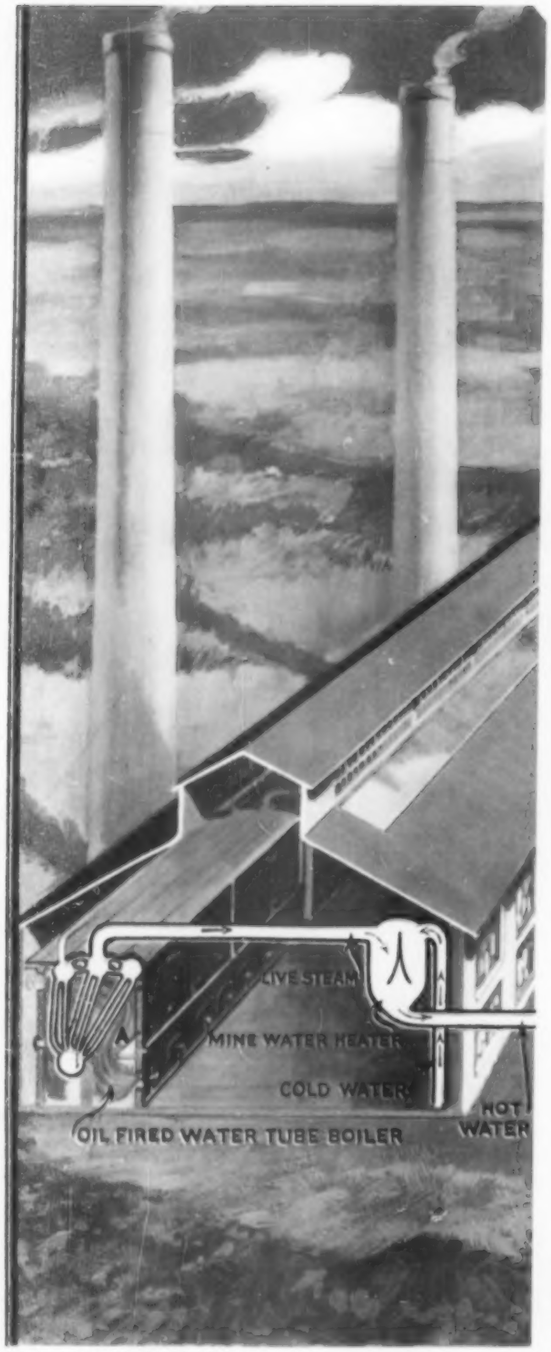
It is fitting to speak of them as a triumvirate because in private life as well as laboratory life the three are inseparable. They always lunch together. Their homes are not far distant. As is common with many engineers, they have no hobbies other than their occupation. For this reason one sees them night after night working in their laboratory, testing one never knows what fantastic invention, taking things apart, putting them together again. To them perhaps more than to anyone else in the company it is permitted to be idealistic because their job is to create and discover, and selling to them is only a minor consideration, anyhow, handled by another department.

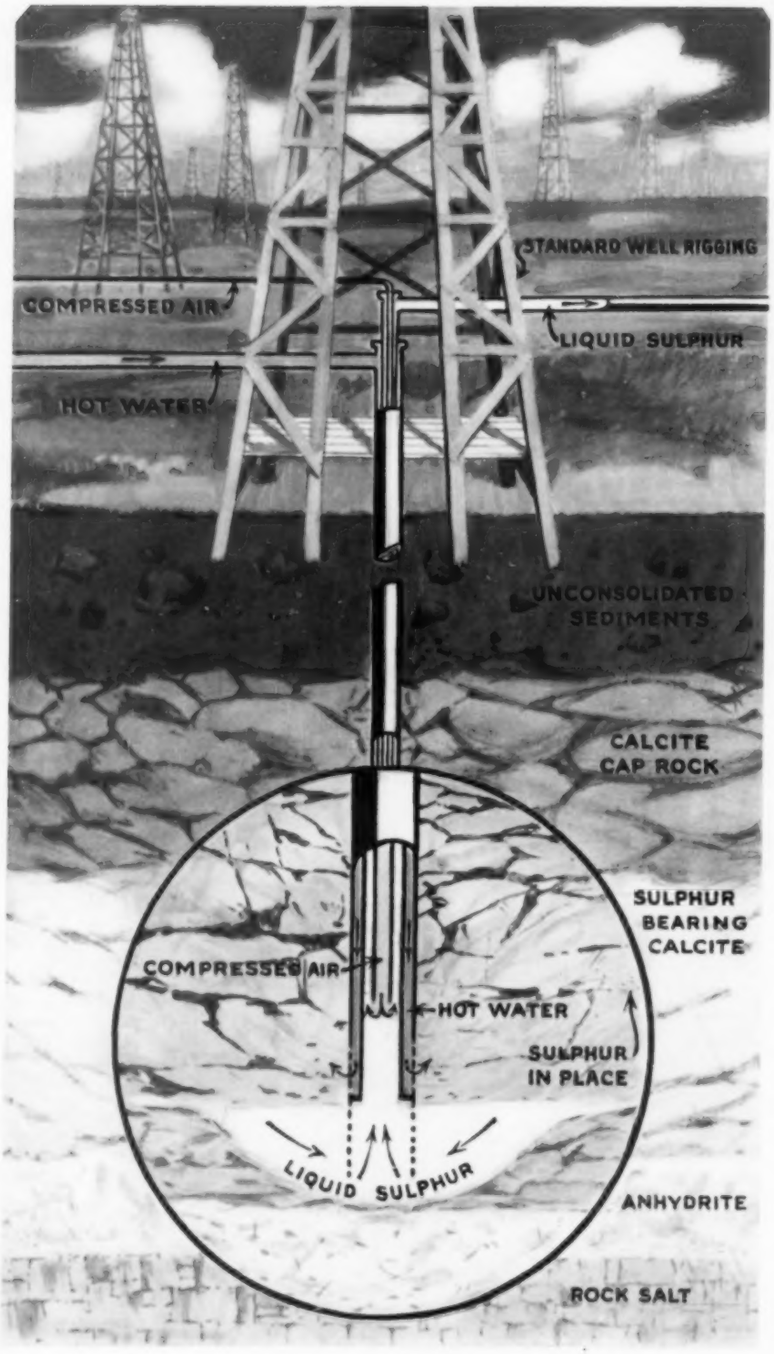
To the lay eye it seems as if the job of these three men were primarily concerned with destruction. The "Belgian Road" machine hereinbefore mentioned serves as an excellent example. This machine is a platform on the top of which two sets of wheels revolve in opposite directions. The platform also has a motion similar to that of a camel's back when it walks. It is the especial delight of Messrs. Zeder, Skelton, and Breer to place an automobile upon this platform and watch it piteously disintegrate. The exact time at which a bolt drops off or a spring breaks is succinctly noted on a chart.

Nor do the experiments of the three allow them to lead sedentary existences. They themselves often take Chryslers on road tests (before the public was aware of the existence of the then new Chrysler Eight, sample cars had already done 200,000 miles of road tests with, as one Chrysler agent vastily put it, the "entire U. S. as a testing ground"). Favorite testing ground of the Chrysler Corporation is Ligonier, Pennsylvania, where are as rocky, sharp, and perilous curves and hills as anyone is likely to encounter. There is another school of thought, however, which holds that the best test of a motor is an Arizona desert. In either of these places one is apt to find occasionally either Mr. Zeder or Mr. Skelton or Mr. Breer.

Of the three, Mr. Breer devotes most of his energies to experiments with motors. Mr. Skelton at present devotes himself to bodies and chassis and is directly responsible for the spring and axle designs. Mr. Zeder is the head of the entire engineering organization. He it is who is most quoted, most mentioned. He is used to having unimaginative reporters ask what has been the greatest influence in his life. He always answers: "My Mother."



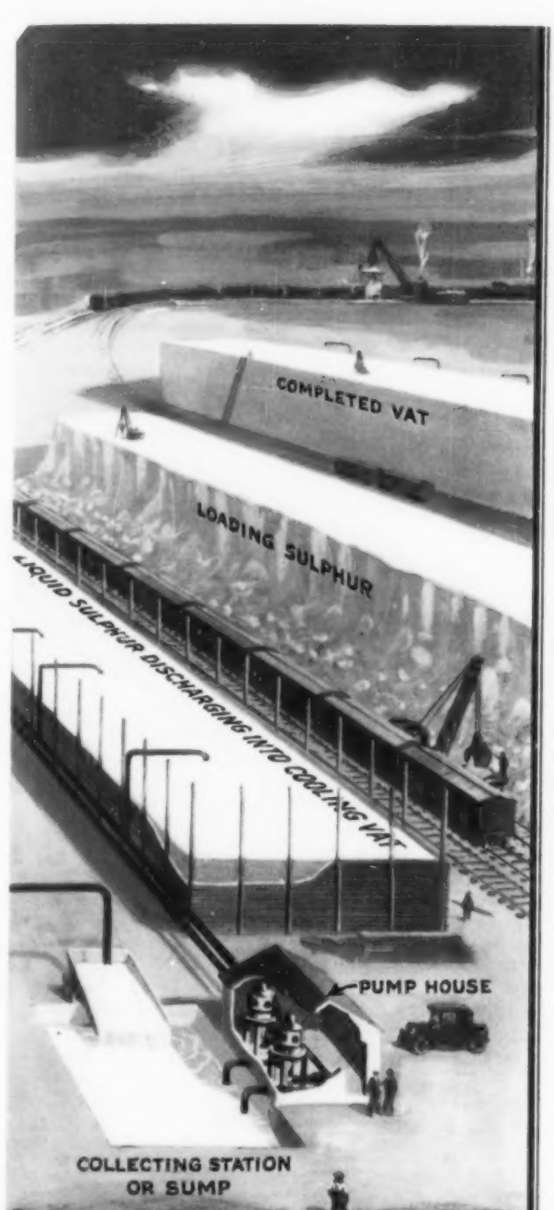




Courtesy of Texas Gulf Sulphur Co., Inc.

The Frasch Process

Probably the most efficient of all processes for extracting an element from the earth was patented in 1891 by Herman Frasch to mine the unique and enormous deposits of sulphur along the edge of the Gulf of Mexico. Without this process American sulphur could never have been recovered because the deposits are overlaid with soft sand and gumbo. On the other hand, the geological formations of all other sulphur deposits in the world make the application of the marvelous Frasch process impossible to them. The Frasch method is used by both the Texas Gulf Sulphur Co. and the Freeport Texas Co., world's largest producers. From vast blue reservoirs millions of gallons of water a day are heated (first panel) to 330 degrees Fahrenheit. Some 118 degrees above its boiling point the water is held in liquid form by a pressure of 110 pounds. Through a six-inch pipe (second panel) it is plunged into the earth to depths ranging from 500 to 1,500 feet. As water spurts from the vents at the bottom of the pipe, the rhombic sulphur into which the pipe has been driven is melted, sinks to the gypsum bottom. The head of water lays great pressure



upon this liquid sulphur, which is forced up a three-inch pipe inside the six-inch water pipe. The addition of air under 500 pounds pressure pumped down a one-inch pipe in the center of the other two forces the sulphur to the surface and along steam-gutted pipes to a distributing tank (third panel). Here it first emerges to daylight. It is pumped to one of several bins, is thinly spread to cool and solidify. When the height of the bin reaches about forty feet, tracks are laid alongside it, the temporary boarding is removed, chunks of sulphur 99.5 per cent pure are blasted off and loaded into freight cars (fourth panel). At every step in this process the companies are roundly taxed by the state of Texas.

Atom S

How he married Venus and was mistaken for the Devil. Of Herman Frasch, "the king of sulphur," and some modern aristocrats. And, particularly, of Texas Gulf Sulphur and Freeport Texas.

OBSCURE and hidden among the chemical elements is sulphur. Its atom, called S, plays such an important industrial rôle that the consumption of it has been taken as the yardstick of civilization; yet almost never is it seen, almost never credited with the fertilizers, newspapers, dyes, explosives, paints, fireworks, and rayon it brings into being. The automobile depends on Atom S for its lubrication, its battery current, its rubber tires. The mechanical refrigerator in the pantry uses Atom S to make ice. Atom S will fumigate, he will bleach, he will pickle steel. Upon your shoe polish, your rubber heels, your golf balls, your soap, your photograph, he has had his mysterious penetrating effect. The U. S. produced 2,362,389 long tons of him last year, had on hand last January some 1,900,000 tons—a vast yellow pile, so cleverly distributed through modern life as to be invisible to the millions who only know his name.

A dashing, romantic fellow, this atom, with a decidedly diabolical reputation, ever since the Chinese first used him to make black powder no one knows how many years B. C. Because he haunts volcanoes the Greeks knew him as Hephæstus, god of fire and the forge, son of Zeus and Hera, who were king and queen of the gods. In a dispute between his parents, Hephæstus sided with his mother, wherefore his father threw him out of heaven in a rage. Atom S fell for a whole day, landing on the volcanic island of Lemnos with such force that he was lamed forever. Lemnos became his particular home, though he might be found in the bowels of Ætna or Vesuvius or any other volcano, forging his wonderful chains and chairs for the gods. In the days of Rome he took the name of Volcanus or Vulcan; and not content with these somewhat Sabatinian adventures, and lame as he was, married Venus, the most lovely of creatures human or divine. Thus long ago was the art of manufacturing linked with beauty.

Meanwhile, in the land of milk and honey beside the Jordan, Atom S had been masquerading in quite a different guise. Here he was known as brimstone, a kind of divine purifying vengeance, akin to fire. Originally identified with the lightning, due to the sulphurous smell of electric storms, brimstone was frequently hurled from heaven by Jehovah upon unrighteous man; was later considered one of the elementary constituents of hell, its pungent odor and variegated flames feeding the imagination of writers on that dismal subject. Out of this grew the semi-mystical conceptions of the alchemists, who, observing the dramatic qualities of Atom S, thought that he represented the principle of combustibility inherent in all metals. He was therefore exalted to be one of the three primal principles of matter (mercury, sulphur, salt), and it was thought that in combination with his brother mercury (the cold silvery metallic principle) he could create gold. He was the "virtue of the world" inherent in every kind of matter, awaiting the Messianic touch of the chôsen alchemical sage to set him free. To Geber (Arabian alchemist of the 8th century) is attributed the saying that sulphur "illumines all bodies, since it is the light of the light, and their tincture." Yet the hero was somewhat dangerous to experiment with because "his indignation gets the better of his discretion."

Scientists now believe they know what this romantic individual looks like. In the list of eighty-eight atoms so far discovered (out of a possible ninety-two) Atom S is number sixteen, which means that he is not as complicated as, say, Atom Hg (mercury), who is number eighty. Hypothetically, he is a solar system of things smaller than himself. At his center is a nucleus composed (so far as anyone knows) of eight units of helium and a few electrons, packed together in a space too small for reasonable figures, the whole having a positive electrical charge of sixteen. Around this nucleus whirl sixteen electrons, each with a negative charge of one. They whirl in three circles, and so fast that, notwithstanding the minuteness of their orbits, each covers some 1,400 miles every second. In the inner circle

Underwood & Underwood

THE WORLD-OLD SICILIAN SULPHUR DEPOSITS ARE MINED WITH PICKS AND HUMAN MUSCLES

there are two electrons, in the middle one eight, in the outer one six. Of all the electrons, those in the outer circle, called the valence electrons, are the most important to the romance of Atom S; it was with them that he made his awful smells for the alchemists, his explosions for the Chinese, and dramatized himself generally before the world.

His modern utilitarian career began when he was first used to make gunpowder or black powder in the 13th century. This is one of his simplest performances. Pure sulphur powder containing nothing but Atom S is mixed very closely with the saltpetre molecule KNO_3—one atom of potassium, one of nitrogen, and three of oxygen. Now to understand Atom S it is necessary to know that he has an unfulfilled desire. He has only six electrons in his outer circle, whereas no atom considers itself respectable unless its outer circle contains eight electrons. (The only atoms born thus are the "inert gases" like neon, argon, krypton, xenon, and these are the aristocrats of atoms and will combine with nothing.) Oxygen has only two electrons in its outer circle, and obviously by sharing their outer electrons, Atom S and Atom O can make for themselves a combined outer circle of eight electrons, and upon their eagerness to do this millions of America's industrial dollars depend. In the case of black powder, they may be encouraged to unite by the direct touch of fire (as when black powder was first discovered); or (as in modern times) by the impact of the explosion from a fulminating cap, itself set off by the blow of a hammer and trigger. By this latter method Atom S and Atom O are knocked closely together; thunderously they unite, the saltpetre molecule (KNO_3) bursts, and there is formed SO_2 (sulphur dioxide), an expansive gas, together with NO (a nitrous gas) and K_2O (oxide of potassium). Carbon (formerly in the form of charcoal) also plays a part in this reaction.

When enough sulphur atoms are collected into molecules to form a visible quantity of matter we have a nonmetallic, acid-forming element—bright yellow, brittle. It is not soluble in water, and it melts (fortunately for industry) at about 239 degrees Fahrenheit. At 478 degrees Fahrenheit it ignites (a low ignition temperature), burning with a blue flame and giving off vile fumes. It constitutes .1 per cent of the first ten miles of the earth crust; 1 per cent of the body; a larger percentage of hair, nails, and animals' horns, 1 per cent of the yolk of egg protein; about 2 per cent of beans, peas, lentils. Its compounds cause the characteristic smell of garlic, mustard, onions. Its potent, burning acid is found in rivers that run down volcanic slopes; in a Persian spring whose sulphurous waters are used for seasoning food; in the snail Aplysia.

Until the 20th century the only industrial supply of free sulphur was that of Sicily, concerning which Atom S entered high finance for the first time, and disastrously. In 1838 the King of Naples sold his sulphur export monopoly to M. M. Taix & Cie. of Marseilles, who boosted the price from £5 to £14 a ton (nearly four times its present price, unadjusted). This monopoly was broken when the British learned to make sulphur dioxide and sulphuric acid from pyrites. They combined with the Italian interests in 1894 to form the Anglo-Sicilian Sulphur Co., capitalized at £735,000. The success was immense; dividends as high as 50 per cent per annum were paid on the common stock. The world was untroubled by the news in 1869 that a great dome of sulphur had been discovered while drilling for oil in Calcasieu Parish, Louisiana, and the first attempts to mine this dome were unsuccessful. But after 1903 the sulphur supremacy, for reasons presently to be considered, began to shift to the U. S. By 1906 Anglo-Sicilian Sulphur had been forced out of business, and to avert another crisis in the Sicilian sulphur mines the Italian Government formed an obligatory trust—Consorzio Obbligatorio per L'Industrie Solfifera Siciliana. All Italian mines must belong to this trust, and the price of Italian sulphur is fixed so that it will never sell below cost.

As if the state of Texas did not already have its share of the earth's riches with a $314,000,000 cotton business, a $227,000,000 petroleum business, a $73,000,000 corn crop, together with countless mines, quarries, and herds, it alone of all states in the Union contains large free sulphur deposits to which the world pays an annual tribute of almost $45,000,000. The sulphur sceptre is now in the hands of $30,000,000 a year Texas Gulf Sulphur Co. and $15,000,000 Freeport Texas Co. Of the 2,362,389 long tons produced in the U. S. last year, these companies contributed 95 per cent, which was over 75 per cent of the world's total production. Sicily reached her maximum production in 1905 with about 550,000 long tons, dropped to 340,000 in 1913, produced about 240,000 tons last year. Japan produced about 59,000 tons last year, Chili 16,000 tons; nowhere else in the world was free sulphur mined in industrial quantities. The Texan deposits are almost on the shore of the Gulf of Mexico, from fifty to a hundred miles south of Houston. All of them were discovered accidentally while drilling for oil; until recent years, when the two American companies have had to face the future, such a thing as prospecting directly for sulphur was unknown. Moreover, the deposits are the only ones of their kind so far discovered, being in the form of rhombic crystals 99.5 per cent pure, lying upon salt plugs that have risen from unknown depths, the whole covered by mounds of clay, sand, and gumbo. Against this set-up the Sicilian and Japanese deposits, in the form of ores containing 10 to 40 per cent sulphur, can scarcely compete.

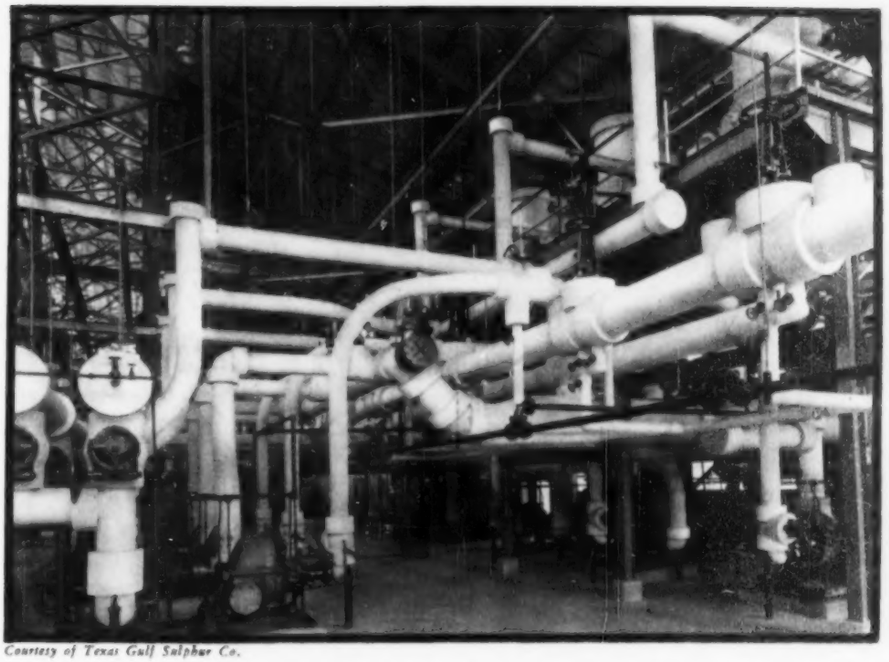
In fact, the only worthy competitor of Texan sulphur is iron pyrite, an ore which, in its yellowest version, is called "fools' gold." Manufacturers of sulphuric acid buy pyrites, from which they extract sulphur dioxide gas (SO_2) by burning. But in some cases this process is expensive; always less convenient than the use of pure sulphur such as is sold by Texas Gulf and Freeport Texas. Therefore pyrites are cheaper than sulphur. The Spanish pyrites dominate, containing about 48 per cent sulphur, but even Spain has suffered by the marvelous growth of Texas Gulf and Freeport Texas, particularly since the War. The U. S. imports of Spanish pyrites have fallen from an average of nearly 1,000,000 tons a year, 1910 to 1916 inclusive, to little more than 500,000 tons in 1929. Copper and zinc sulphides constitute a third source of sulphur, which is thus a by-product

of copper and zinc mining, but the quantities so released to industry can hardly be called competitive to the production of the Texas companies.

Thus the position of Texas Gulf and Freeport Texas is such as has fallen to the lot of few American corporations. Not only does their product enter every home, office, and conveyance in the land, but 855,500 tons of it—more than 30 per cent—are exported to a world becoming more and more dependent on sulphur for its industrial life. Furthermore, either of the American giants could undersell the European producers ton for ton if it chose to. Neither of them does so because the export price of sulphur is fixed by agreement with the Italian Government under the terms of the Webb-Pomerene Act. A further agreement with Italy allows her a minimum export tonnage of 25 per cent of world demand outside of Italy and North America, but this figure is somewhat greater than she is able to meet. The exporting is carried on by the Sulphur Export Corp., formed in 1922 and owned equally by Texas Gulf and Freeport Texas, and the export tonnage is equally divided between the two owners. But while the foreign price ex-vessel usually runs a few dollars higher than the ex-vessel New York price, there is a clear line to be drawn between the foreign quotations, fixed by agreement (for the protection of the Italian producers), and the domestic quotations which, as a recent government investigation has shown, are determined by no agreement of any kind. The price of cheaper pyrites is the chief domestic determinant, the aim of both Texan companies being to make it worth while for sulphuric acid manufacturers to use sulphur instead of pyrites.

Other factors make the position of Texas Gulf and Freeport Texas even more unique, particularly the stability of the price of sulphur at the mine. Although the price has risen from $14 to about $18 since the over-production years following the War, it has not had a spread of more than fifty cents a ton in any year since 1926, the cause of such stability being that sulphur is sold on long term contracts to established customers who guarantee one producer or the other all the business they have. The price of 99.5 per cent pure sulphur (as it is guaranteed by both producers) is still further stabilized by the almost infinite ramifications of sulphur in modern life, which means that if a certain market for it is weak, some other is almost certain to be strong. For instance, the present low price of zinc has forced many zinc mines to close; sulphur dioxide, a by-product of zinc mining, is no longer available; sulphuric acid manufacturers must buy sulphur from Texas. Especially in the Middle States this outlet has compensated for a slight falling off of sulphur sales in the present depression. On the other hand, when it occurs, overproduction of sulphur is not costly and storage in the great weather-exposed yellow bins is almost negligible (taxes aside). And by way of final blessing, there is no such thing as a sulphur junk pile, as there is for copper and iron; once consumed, every atom escapes forever the mercenary clutches of men.

Largest sulphur producer in the world, Texas Gulf is also younger than its nearest competitor, for although the company was incorporated in 1909, its active production did not begin until 1919, when it opened the huge Matagorda deposit and erected the town of Gulf, Texas (1,500 inhabitants). Greatest and most economical sulphur deposit in the world, Matagorda has now produced consistently for ten years and may be considered to have entered its old age.



Courtesy of Texas Gulf Sulphur Co.

BUT IN TEXAS THE PUMPS AND PIPES OF INDUSTRY CONVERT SULPHUR MINES INTO WELLS

Chemical & Metallurgical Engineering

HERMAN FRASCH

INTERESTED IN SULPHUR AS A SIDE LINE TO HIS DUTIES AS CHIEF CHEMIST OF THE STANDARD OIL CO., HERMAN FRASCH (LEFT), WHO EMIGRATED TO AMERICA IN 1868 AND STARTED LIFE AS A PHARMACIST, REVOLUTIONIZED THE SULPHUR INDUSTRY, SET AMERICA UPON A YELLOW THRONE

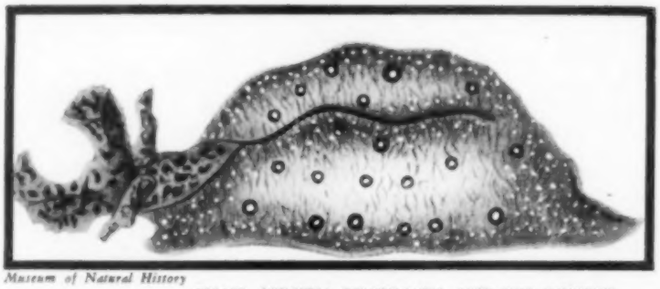
Foster

LANGBOURNE M. WILLIAMS JR.

A NEW POWER IN THE SULPHUR INDUSTRY: LANGBOURNE M. WILLIAMS JR. OF RICHMOND, VIRGINIA, VICE PRESIDENT AND TREASURER OF FREEPORT TEXAS CO. HIS CHIEF, EUGENE L. NORTON, IS AN EMINENT BALTIMORE FINANCIER. O. R. SEAGRAVES OF UNITED GAS CO., AVIATOR, IS CHAIRMAN OF THE BOARD

Nevertheless, for any possible decline in yield, far-sighted conservative Texas Gulf, whose board of directors includes some of the most distinguished financiers of the nation, is amply prepared. Between Gulf and Houston, Newgulf has been constructed, where the company has recently begun to mine Boling Dome and Long Point Dome (both leased from Gulf Oil Corp.), with an estimated life of forty years. This stride into the future was taken very gracefully, beginning in 1927, its cost of some $15,000,000 to date being paid out of earnings without any new financing or any quiver in the $4.00 dividend rate. Although production has increased only 100,000 tons from 1926 to 1929, a rise in the average price of sulphur at the mine from $14 to $18, together with a quickening of sales relative to production, has increased the gross from $18,152,000 to $29,883,000, and the net income before depletion from $9,383,000 to $16,247,000. Depletion reserve is blanketed under a $21,000,000 surplus. By way of illustrating the stability of the sulphur market, during the stock crash of November, 1929, the company did the largest business of any month in its career; for 1930, while foreign orders have slumped badly, the company anticipates only a slight decrease in total sales.

Less smooth has been the course of Freeport Texas, a holding company with a broad charter, whose chief subsidiary is Freeport Sulphur Co., owner of Bryanmound and leasor of enormous Hoskins Mound from the Texas Co. (the oil corporation). Texas Co. extracted 300,000 barrels of oil from the dome before leasing it. The estimated life of Hoskins Mound is twelve years, that of Bryanmound three; but these figures are conservative and are typical of a number of things that have happened to Freeport Texas in recent months. When the Freeport Texas syndicate was organized in 1911, John L. Williams & Sons, bankers of Richmond, Virginia, were members of it, but were not in agreement with the management formed in 1913, or with President E. P. Swensen, former chairman of the board of the National City Bank. The Williams' interests, never exactly quiescent, undertook an active investigation when the stock, having risen from 36 to 109, dropped forty points in forty days during the bull market of January, 1928. In April, 1930, they achieved a working control of the corporation. New President Eugene L. Norton is a Baltimore financier, while young, aggressive Vice President and Treasurer Langbourne M. Williams Jr. has been prime mover of the reorganization since entering his father's firm in 1928. Having installed themselves in office last July, this management has written off $1,867,000 from surplus, has announced a reduction in officers' salaries of 30 per cent, begun prospecting, created new depreciation reserves, issued serious statements to stockholders. While intending to maintain the present $4.00 dividend rate, they believe that the dividend policy of Freeport Texas has been extravagant hitherto. Since 1926 the company has paid out $10,765,000 in dividends from earnings of $11,095,000.



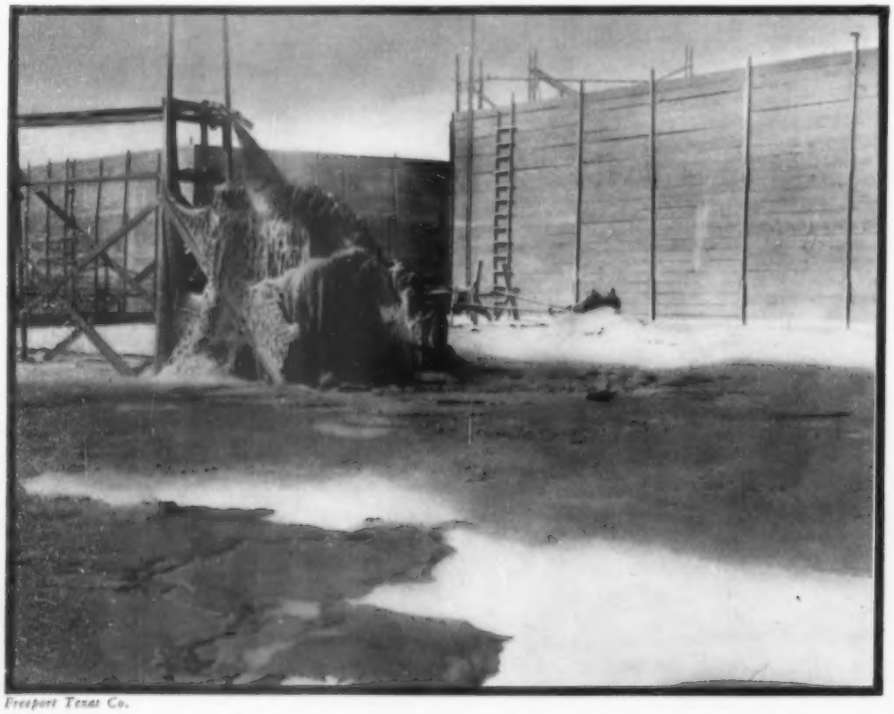
Museum of Natural History

SNAIL APLYSIA FIMPRIATA AND HIS COUSIN . . .

They are called sea hares, resembling the swifter land hare a-crouch. Cirrhifer is found off the Island of Mauritius, Indian Ocean; Fimpriata in the shallow

In his fabulous distribution through industry Atom S is no myth, as perhaps he was in some of his other incarnations. His great affinity for oxygen is used to build up the powerful molecule of sulphuric acid (oil of vitriol) (H_2SO_4), without which modern industry would literally be helpless. Over 50 per cent of total sulphur production goes to industry as sulphuric acid, used most familiarly in the storage batteries of the nation's automobiles. The principle of the battery is the converting of electrical energy into chemical energy (charging) and the reversing of this process (discharging). To accomplish this, a positive electrode of lead peroxide and a negative electrode of sponge lead are immersed in a bath of dilute sulphuric acid. If the two electrodes are connected by a wire, the sulphuric acid molecule will break up and form lead sulphate on both electrodes and water. This will produce a current flowing out by way of the lead peroxide electrode. If an electrical current is forced through the battery in the opposite direction (from the lead peroxide to the lead), sulphuric acid molecules are built up again, the battery is made ready to send back current the other way. The sulphuric acid in this case is called an electrolyte, and there is no other electrolyte so efficient.

But Atom S not only starts cars in the morning and lights them at night: without it there could be no rubber tires. Vulcanizing—the word recalls our hero's marriage to Venus—converts rubber from a gummy, soluble raw material into sleek, insoluble auto paws. Atom S plays other automotive rôles in the manufacture of automobile paint, automobile fuel, automobile lubrication, automobile fabrics, and a hundred plated parts that automobile drivers know little about. Enormous too, and ever-growing, is the use of sulphur in the treatment of wood pulp. Out of this industry come three very different products—newspaper, stockings, and explosives. In a sulphite form—usually calcium bisulphite—Atom S is used to reduce wood



Freeport Texas Co.

HOT LIQUID SULPHUR POURING INTO A BIN. COOLING, IT TURNS A BRIGHT YELLOW

Museum of Natural History

. . . APLYSIA CIRRHIFER, SECRETE SULPHURIC ACID

waters of Japan. They discharge purple cloudy fluid in which they hide from enemies; contain sulphuric acid, the "life blood of modern industry."

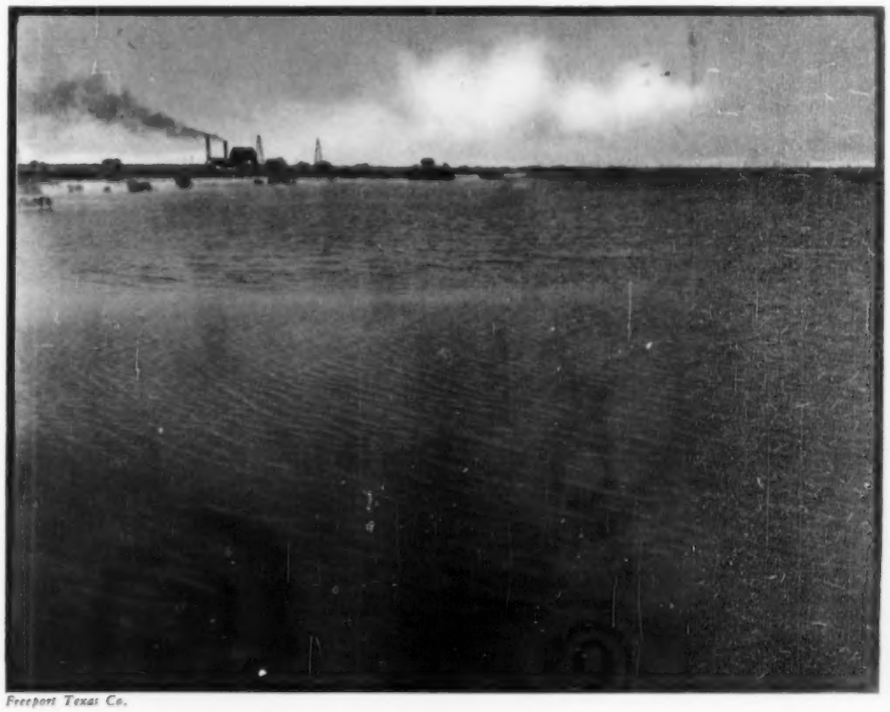
chips to pulp, dissolving the woody tissues (lignin) and leaving the cells of cellulose practically intact. It is also part of the "spinning bath" of the rayon manufacturers, and so dependent are they upon him that for every ton of rayon produced, one and one-half tons of sulphuric acid (66 degrees Baumé) are consumed. Besides its use for stockings, the rayon thread is, of course, used to make cotton goods, knitted underwear, rubberized surgical silk, woolen outer goods, automobile tires. Irony of modern industry, this former god of fire is now used in the manufacture of fire extinguisher fluids. Although essential to the manufacture of modern high explosives, it is no longer a part of the final product. Contrary to popular conceptions, it scarcely enters into the match industry at all, phosphorus (Atom P) having been substituted almost entirely; nor into the metal working arts, the sulphurous smell of giant steel plants arising from sulphur dioxide (SO_2) released in vast quantities by the burning of coal. The importance of Atom S to the steel industry lies in its use for pickling steel, 770,000 tons of sulphuric acid 50 degrees Baumé (about 154,000 tons of sulphur) having been bought for this purpose in 1929. This pickling is a process of cleaning off, before plating or galvanizing, a thin coat of oxide that forms on all rolled steel plate or drawn wire.

But add these 154,000 tons used by the steel industry every year to other tons used in dyeing, in purifying water, in making glass, soap, moving picture films, celluloid, high explosives; add still more tons used to make paint and pigments, electrolyte, glue, glycerine, alcohol, shoe polish; add, if you will, the cubic miles of sulphur dioxide gas used by mechanical refrigerators, fumigators, bleachers, and food preservatives—you have still not equaled, in tons of sulphur, the amount consumed every year by the agricultural industry alone. For sulphur must be ranked among the great fertilizers of the soil, acting not as a plant food but as an agent, shifting the composition of other elements, liberating the essentials of plant life. For this purpose, and as insecticide, the U. S. bought 415,000 tons of sulphur in 1929. While this is only 5 per cent of the Union's staggering 7,914,688 fertilizer tonnage, fertilizers containing sulphur make up more than half of those annual tons.

Chief of the sulphur fertilizers is super-phosphate, or acid phosphate, the introduction of which into British agriculture eighty years ago produced a revolution, especially in the important turnip and swede crops. Many soils throughout the world are starved of phosphorus, the application of which benefits the land in the middle western states of the U. S. most notably. Since crops are constantly being removed from the soil, the supply of phosphorus is constantly being diminished. It can be renewed by the application of manure, but there is never enough manure. Chiefly in Florida and Tennessee there are deposits of rock phosphates. These are pulverized and combined with sulphuric acid. The result of this combination is that the sulphur and oxygen atoms of the sulphuric acid unite with a calcium atom of the phosphate rock, forming calcium sulphate or gypsum ($CaSO_4$), while the hydrogen atom of the sulphuric acid unites with a phosphorus atom, more oxygen, and more calcium to form a calcium phosphate salt that is soluble in water. This solubility makes the phosphorus available to plants. Again, in the form of ammonium sulphate, Atom S stimulates the sugar beets of France, the oranges of Spain, the rice of Japan, the sugar of Java. In the U. S. it benefits especially alfalfa, cotton, tomatoes, and sweet potatoes. It is sometimes used to neutralize acid soils. Death to bugs, it has saved many a potato crop, many an orchard, when used as a sulphur dust or spray.

Behind these varied industries, behind the U. S. domination of the sulphur market, stands the brain of a single man. Herman Frasch, the "king of sulphur," was the son of a burgomaster of Gaildorf, Württemberg. He emigrated to America as a pharmacist in 1868, and finally became chief chemist for the Standard Oil Co. When the first U. S. sulphur mine was discovered in Louisiana—according to history by the Louisiana Petroleum & Oil Co; according to legend by a country physician drilling for oil, name unknown—attempts to mine it proved fatal because of the deadly fumes and quicksand. Frasch set about developing a process that would make the valuable deposit available to industry. In 1891 he patented a disquieting idea, an idea at which the Anglo-Sicilian captains snorted and of which Frasch's friends in the Chemists' Club, New York, made comedy. For years Frasch argued that sulphur melts at 239 degrees Fahrenheit, only fourteen degrees above the boiling point of water; that water under pressure can be heated above its boiling point (this is called superheating); that if, by an ingenious arrangement of pumps and pipes, superheated water could be injected into the Louisiana deposits, the sulphur at the bottom of them would melt, could then be forced to

[*Continued on page 118*]



Freeport Texas Co.

A RESERVOIR TO BE HEATED ABOVE BOILING POINT TO MELT THE BOWELS OF THE EARTH

© Norman Bel Geddes

MODEL FOR AERIAL RESTAURANT DESIGNED BY NORMAN BEL GEDDES
FOR THE CHICAGO WORLD FAIR

Built of steel, glass, and aluminum, this restaurant is perched on a steel shaft, 278 feet in height, and slowly revolves so that diners, between the *hors d'œuvre* and the coffee, may enjoy a complete panoramic view of Chicago, the fair grounds, and Lake Michigan. There are actually three restaurants on three levels. The lowest seats 600 people and has a dance floor. The middle level is devoted to refreshments. The highest prices will be asked on the highest level. The shaft contains three guest elevators and nine service elevators.

Skyscrapers: Builders and Their Tools

From headquarters issue a hundred coördinated commands. Caissons bury their noses in quicksand, an engineer blindly obeys a tinkling bell, silently Eagle's Gang plays ball with rivets, the Tower rises, and Ed Radigan fingers a gold button.

THERE will be a neat and entirely legible sign on the board fence around the excavation reading George A. Fuller Co., Builders, or Thompson-Starrett Co., Inc., Builders, or Marc Eidlitz & Son, Inc., Builders, or Starrett Brothers & Eken, Inc., Builders. Below in equally neat but much less legible lettering will appear the architect's name. And the difference in lettering expresses the relative importance of architect and builder at this stage of the proceedings pretty accurately. Between the completion of the plans and the opening of the doors, it is the builder's show. He runs it. He runs the materials and he runs the men and when the lot looks most like a cross between the Times Square subway station and the Hanging Gardens at the County Fair, he is running it the hardest.

Anyone who got past the gatemen at Forty Wall Street in August or early September of last year might have discovered that for himself. Forty Wall (The Manhattan Company Building) presented every difficulty known to the building trades. It was going to be the tallest or the second tallest tower on Manhattan Island. It was being built in the most congested district of New York with another skyscraper going up across the street and two more in the neighborhood. And it was to be built in eleven months instead of twenty or twenty-four. The lot looked it. In August the steel was well up in the air, the masonry was only a few floors below it, and the terra cotta workers and carpenters and ornamental iron people were all over the lower floors. There were about 2,000 workmen in the building. The air was filled with the descending dust of a dozen trades sifting down through the hatches and the shafts. Bell signals like the repeating strokes of a house full of insane clocks chased each other through the columns. The riveting away up aloft sounded like machine guns across a valley. The ground floor and the basement were filled with men pushing wheelbarrows, men carrying sacks, men with tools in their hands. Hoists were vanishing up dusty chutes. Donkey engines clattered. There was no order or sense to anything, and the young men with the notebooks who dodged in and out through the crowds only emphasized the confusion. And actually the whole process was under the most complete and observant control. The hoists and the sacks were moving in accordance with a carefully constructed plan. The men were where they were expected to be. And the building was going up faster than any building of comparable size had ever gone up before.

The central point of the control was a heavy-set, dark-haired, large-handed ex-carpenters' foreman named Adams. Mr. Adams was superintendent of the job. He sat at a desk at one end of the shed Starrett Brothers & Eken had put up for their field offices on the bridge.

This was the executive office of a great industry. From this wooden shack the expenditure of $12,000,000 in steel and brick and cement and wood and men would be directed and recorded.

Auditors and Timekeepers.—The recording was the basis of the direction. It was necessary for the builder to know at every moment what he had spent, and for what, in order that he might know where he was going and how. The records of the timekeepers have three main uses: to determine the pay owed the builder's own workmen, to determine the liability insurance rates (and since the rates differ with the trades, record must be kept of every change in the employment of every workman: if a painter goes from inside to outside painting at 10.27 A.M it must be known in the timekeeping department at once), and to determine labor cost to builders or sub-contractors when builders or sub-contractors are employed on a cost-plus-fee basis. Starrett Brothers & Eken do their own liability insurance work for their own men through their own insurance company, but the premiums are part of the cost and must be precisely computed.

The usual method of timekeeping was used at Forty Wall. A workman arriving at the job checks in by receiving a small brass coin from a checker at the gate. On leaving the job he checks out by returning it. And during the day his presence is twice assured by personal inspections. Of the twenty-four timekeepers at Forty Wall, thirteen were engaged in this latter work.

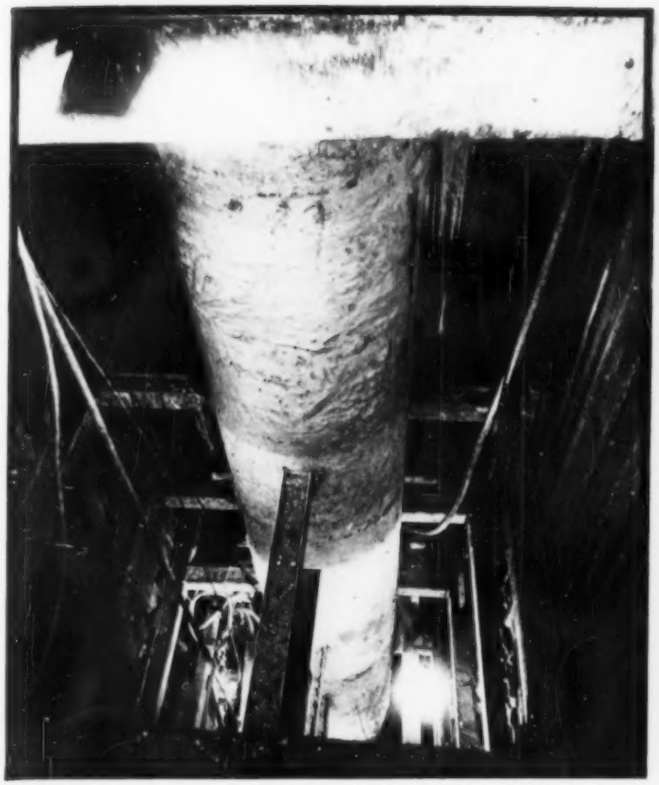
The Job Runner.—Field operations are in the hands of the job runner—a sort of combination liaison man and brigade commander. He is responsible for contacts with the sub-contractors and the architect and for the disposition of the drawings which control the work. These drawings are continuously in transit, the architect correcting the sub-contractor's blue prints and the sub-contractor laboring to make stone and iron shapes out of the architect's designs, and the job runner must know at any given moment where any given drawing is to be found. Also he is responsible for the prompt and regular delivery of materials. Which means that in all fabricated materials expediters from the job runner's office must follow shipments from the manufacturer to the site and must, in some cases, pursue the raw materials from their source, the quarry for instance, to the factory. In the case of Forty Wall Street, for example, seven expediters were used.

The steel deliveries were the most important and hence were most carefully watched. Levering & Garrigues, the steel erectors at Forty Wall, worked on a weekly schedule. Every Monday morning a meeting was held in their offices attended by representatives of their drawing room, their purchasing agent, their own fabricating shop and the shop of the Bethlehem Steel Corp., and their own erection department. A decision was reached as to the quantities of steel to be delivered during the week and the days of delivery. Two days before the steel was due the expediters went to the foreman on the job and were instructed as to the *hour* when the steel would be needed. They then communicated with the railroad yard office on the Jersey side of the river to be sure that the expected cars (700 or 800 were needed) had arrived, and notified the lighterage department of the railroad of the weights to be carried across the river. Having arranged for their lighters, the expediters then telephoned the New York City dock master to reserve a berth and the trucking company to secure the necessary trucks. Most of the slips in steel delivery occur somewhere between the berth and the lighter. The trucks, which are rented by the builder, rarely fail, and the railroad can usually be counted on. The Lehigh Valley Railroad is particularly popular with steel erectors as it keeps a continually changing and constantly accurate record of the whereabouts of all cars.

Once arrived on Manhattan Island the steel was loaded on the trucks according to the markings given it. On the Forty Wall Street job each derrick was given a color and each truck driver was told the color of the derrick for which his steel was destined. The trucks were then driven to a point south of William Street and out of the traffic from which the building could be seen. As a derrick needed steel, a flag of its color was

TOWER OF BABEL—*BY BREUGHEL*

PETER BREUGHEL, GREAT PAINTER AS HE WAS, WAS ALSO A GREAT ENGINEER. HE UNDERSTOOD THAT IT WAS NOT THE LANGUAGE PROBLEM, BUT THE WEIGHT AND THICKNESS OF THE MASONRY WALLS WHICH LIMITED THE HEIGHT OF BABEL'S TOWER



THE CAISSONS ARE ROLLING ALONG

Only this kind will not roll. Or even move. The cylinder on the left is a sixty-foot open caisson working down by hand through the quicksand under The Manhattan Company Building. When filled with concrete, as in the picture on the right, it supported its share of twenty stories of steel while a square caisson for the permanent foundations went down around it.

broken out, and the proper truck drove in.

The Chief Labor Foreman.—Under the assistant superintendent for the mechanical trades stand the various foremen for the various trades. Most important of these so far as deliveries are involved is the chief labor foreman. He is responsible for the allocation to the proper floor and place of materials which, unlike steel, cannot be swung up at once by outside derricks. On the Forty Wall Street job the chief labor foreman had at his disposition eight hoists, four of them running to the top of the building. These hoists were the property of Starrett but were available for the use of sub-contractors at $5.00 an hour—the actual cost of operation and maintenance being about $15 an hour.

The delivery of labor to the various floors was also a problem in the Forty Wall Street tower. The elevators available did not go to the top of the structure as it rose and, since the men checked in at the gate, the climb from the top of the shaft to the fortieth or fiftieth floor was made on the boss's time. Starrett estimated that the loss at the height of employment amounted to as much as $1,500 a day and that the working time of some of the men was cut to six hours. It was for this reason that elevators for the workmen were installed at a considerable initial expense on the Empire State job in 1930.

The coördination of all these various items of material deliveries and labor allocation and timekeeping in the little portable house on the bridge did not, however, complete the Starrett organization. Starrett had other jobs going on at the same time, sixteen of them, involving a total of $75,000,000. And all these jobs were controlled, as was the job at Forty Wall Street, from the central office of the company. It was possible for Mr. Eken in his office to say just how much money he had in the building as of August 18, just how far each item of construction had been carried, and whether or not (barring acts of God and the public enemy) the building would be finished on the following May 1.

FOUNDATIONS

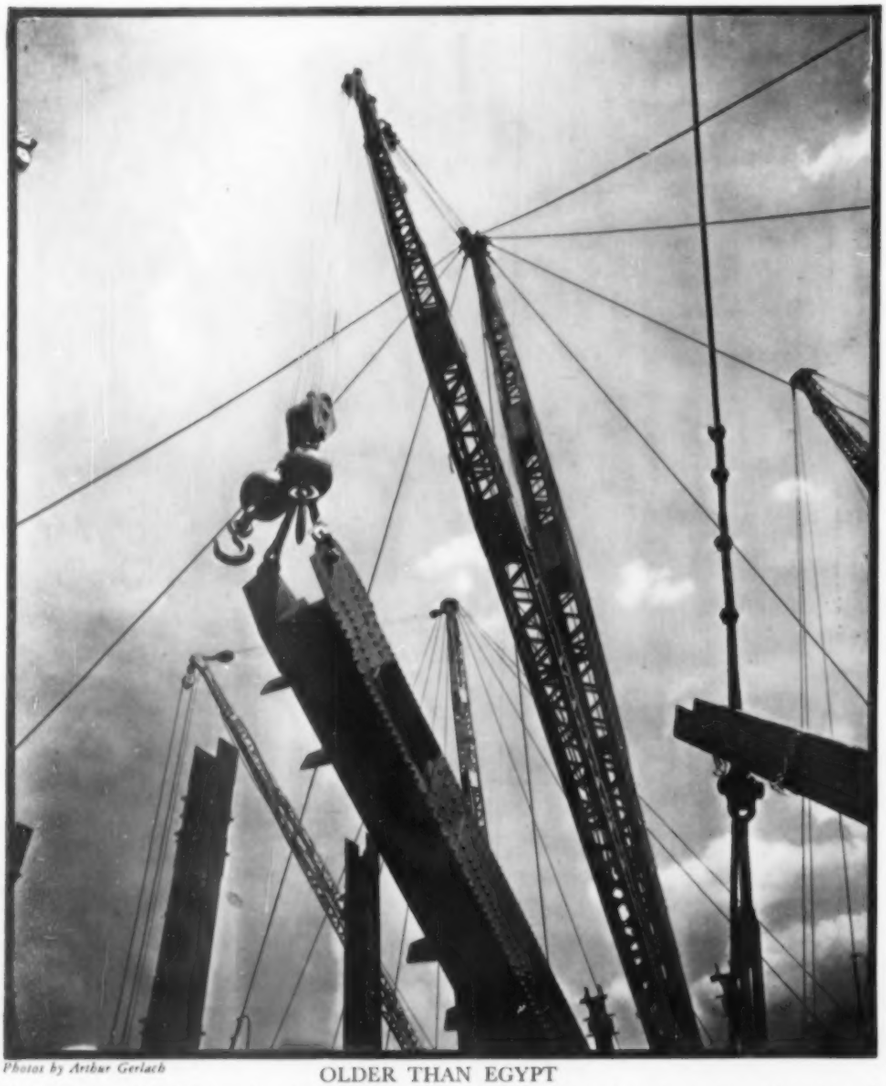
Accomplishment of the obviously impossible at 40 Wall.

THERE is rock under the city of New York as there is rock under Mexico City (if you can find it). But the rock level in the lower island alone is anything from 183 feet below curb level and 150 feet below high water at Duane Street to forty-two feet above high water at Thirty-third Street. And over the rock is sand (quicksand and running sand), which will flow like slow water into new excavations and out from under neighboring walls. Where the rock is too deep, skyscrapers will not flourish. They cost too much to build.

Consequently the first task of foundation engineers is to advise promoters as to the feasibility of sinking adequate foundations on a given site. Most of them use, for this purpose, not geological survey sections, but a map called the Vielé Map, which shows the street markings of the city superimposed upon the old streams, ponds, and original shore lines of the city. If the site is over an old stream or a pond (as in the district around Chambers Street), the engineers are apt to advise against skyscraper construction on the ground that the rock will be low and the sand silty. But in almost any downtown location difficult footings between curb level and rock must be expected.

The situation in Chicago, substituting clay for sand and increasing the depth of the rock level, is approximately the same. So is it in London and in the cities of the Mississippi Valley. Alluvial deposits of sand or clay over ledges of subterranean rock.

The problem of supporting 25,000 to 50,000 tons of masonry, hung on such bottoms, is not a simple one. In Chicago, where the first true skyscrapers were built, an attempt was made to float the steel on rafts of stiffened



Photos by Arthur Gerlach

OLDER THAN EGYPT

And still working. The modern derrick hitches the physics of the Pharaohs to the engines of America and builds skyscrapers four floors a week.

concrete. But even under such relatively light loads as two tons to the square foot the buildings settled. And went on settling for years. Then, in New York, an attempt was made to drive wooden piles to hard pan, cutting them off at water level. But the water level would go down as the result of subsequent pumping in the neighborhood, and the piles would rot. Finally Charles Sooysmith, an engineer contractor who had had experience with the construction of pneumatic caissons in bridge construction, succeeded in sinking masonry piers to bed rock. Open-bottomed steel air chambers, large enough for the operations of excavators working inside them, ate their way down through the muck, and on their backs, as they descended, bricklayers erected piers. So that eventually the building, like the elephant on the back of the tortoise, stood on the bells of steel. And the bells of steel stood on the rock.

But it is not enough to find the means of sinking your own foundations. Foundations of existing buildings must, at the same time, be safeguarded. To protect them the practice grew up of jacking steel pipes down to hard pan under the walls surrounding the lot and of damming back the quicksand by driving a wall of metal around the entire periphery.

Subsequent developments have substituted (for the pneumatic chamber) caissons, like lengths of steel sewer pipe stood on end, which are let down as the excavators work the ground out from under, and are at last filled with concrete; and concrete-filled steel tubes which are driven down to bed rock by pneumatic or steam hammers. The latter, the latest development in the field, are preferred because they expedite the work.

The foundation work and the excavating for Forty Wall Street illustrate the difficulties encountered and also constitute one of the great engineering triumphs of this branch of building. The complicating elements of the problem in that case were as follows:

> The soil was quicksand to forty-nine feet below street level and thereafter hard pan (with a mixture of boulders) to rock bottom at an average of sixty-four feet.
>
> The lot was already built over with old-fashioned structures having heavy masonry foundations.
>
> The lot was located in one of the most congested districts of the city.
>
> Due to the value of the land and the heavy carrying charges, speed was of the essence of the contract. The last tenants vacated the old building on May 16, 1929, and the steel work was scheduled to begin June 17, 1929.
>
> It was impossible, in view of the speed requirements, to delay foundation work until the wreckers had cleared the site: both wrecking and foundation work had to be done in thirty-two days. Which meant that they had to be done at the same time. But if they were done at the same time, it would still be impossible to complete the foundations within the time allowed.

Faced with this situation, Spencer, White & Prentis, Inc., the foundation engineers, adopted a program never previously attempted in skyscraper construction. They decided to build their foundations in two steps: a preliminary light footing capable of carrying twenty stories of steel and so constructed that it could be added to while those twenty stories were going up upon its shoulders, and a final heavy footing capable of carrying the whole weight of the building.

This program was carried out. The old foundations fouled the new work at every point, and the girders of the old buildings cut down the head room to such an extent that it was impossible to use driven caissons. The adjoining building on Pine Street, which had been built upon a concrete mat, had to be underpinned with sectional steel cylinders. The open caissons, which were worked down by hand, struck boulders of great size. Care was required to keep quicksand from boiling up in the working chambers. And traffic conditions inside and outside the lot added to the natural difficulties of the work. But by the time the old buildings were completely demolished the light footings were ready to take the steel, and by the time the steel had risen twenty stories the permanent footings were in place. These methods saved four months' construction time. The interest charges alone during such a period would exceed $300,000.

DERRICK GANGS

A miraculous enterprise of the 10th, 25th, and 26th floors.

IT IS one thing for the architect and the structural engineer and the fabricator's draftsmen to design the steel members of a great building so that they will fit precisely into their slots in the actual frame. And it is another thing to put them there. Excellent administration and skillful planning and constant supervision will roll truck No. 7D

down Wall Street with thirty tons of columns at the precise moment that the fall line of derrick No. 5 on the twenty-fifth floor gropes down to street level for another load. But from that time on the labor is actual. And dangerous. And hard.

It is done on precarious footing—on loose planks thrown across a framework of unfinished steel. It is done at great heights. It involves the manipulation of enormous and clumsy burdens capable of destroying everything below them should they fall. And it is controlled by the hand of a man who can see nothing whatever of the work he does. The derrick stands upon the framework of the twenty-fifth floor. Its crew works above it on the lightly bolted skeleton of the twenty-sixth. And the engineer who controls the gigantic boom and the slowly winding fall stands with his engine on the tenth. He moves his levers to the tinkle of a bell blurred by the rattling rivets. As the bell strikes he shuts the power off. As it strikes again he lifts. He cannot see the heads an inch or two beneath the sagging beam.

Actual erection is done altogether by the derrick gangs. It is they who raise the steel from the trucks to the working level, who assort it by number with reference to the erector's plan, who swing it into place and bolt it there. They are clever and hardened men. An assistant foreman, like a profane orchestra conductor, directs the derrick, yelling at the bull-stick man who turns the boom, signaling with his arms and his hands to the man who yanks the engineer's bell, jerking his head at the tag line pair whose line guides the dangling column. The sluggish load swings over. The fall line eases an inch, a half inch, till the rivet holes coincide. And the two connecters, straddling the unsteady bar with the street 300 feet below them on one side and the narrow ribs of steel upon the other, slide their bolts in place. It is they who take the greatest risks. They are often killed.

It remains to plumb the column and rivet it. A plumber-up's apprentice climbs to the column's top and lets fall a plumb line. The leanings are marked down. Wire guys and turnbuckles are rigged and the errors corrected. And the column is left for the riveters who follow two floors or three below.

THE ARTISANS ARE DEAD

And these are the new artisans. The master-workmen of our time drive steel to steel with hammer strokes of air. But they still depend upon the judgment of hand and eye. And their necks are still breakable.

RIVETERS

Why the bloodless building is still a marvel.

THE trouble with all the talk about the decay of artisanship is that it is true. It has always been true. It was true when the last wattle-weaver died and they took to building houses of brick. And it will be true when the tools and machinery of the contemporary arts are replaced by atomic explosions. It is so true that no one takes time to remark that the decay of one kind of artisanship is almost always caused by the growth of another. Modern carpenters would have been laughed off one of the Adam Brothers' jobs. But a riveter can't be expected to break his heart over that.

The most curious fact about a riveter's skill is that he is not one man but four: "heater," "catcher," "bucker-up," and "gun-man." The gang is the unit. Riveters are hired and fired as gangs, work in gangs, and learn in gangs. If one member of a gang is absent on a given morning, the entire gang is replaced. A gang may continue to exist after its original members have all succumbed to slippery girders or the business end of a pneumatic hammer or to a foreman's zeal or merely to the temptations of life on earth. And the skill of the gang will continue with it. Men overlap each other in service and teach each other what they know. The difference between a gang which can drive 525 inch-and-an-eighth rivets in a working day and a gang which can drive 250 is a difference of coördination and smoothness. You learn how not to make mistakes and how not to waste time. You learn how to heat a rivet and how not to overheat it, how to throw it accurately but not too hard, how to drive it and when to stop driving it, and precisely how much you can drink in a cold wind or a July sun without losing your sense of the width and balance of a wooden plank. And all these things, or most of them, an older hand can tell you.

The gang photographed on page 90 is Eagle's Gang, a veteran of the Forty Wall Street job, reputed in the trade to be one of the best gangs in the city. The gang takes its name from its heater and organizer, E. Eagle, a native of Baltimore. It is the belief of timekeepers, foremen, and the leaders of other gangs that Mr. Eagle is a man of property in his home town and indulges in the sport of riveting for mysterious reasons. There are

THE "HEATER"—*Eagle himself.*

THE "CATCHER"—*He keeps them off the millionaires.*

THE "GUN-MAN"—*Not what the name implies.*

THE "BUCKER-UP"—*He holds them in against the gun.*

THIS IS EAGLE'S GANG. RIVETERS WORK IN GANGS; ARE HIRED AND FIRED IN GANGS; BECOME SKILLFUL AS GANGS. THE GANG IS THE RIVETER. AND THIS IS ONE OF THE BEST GANGS IN THE CITY OF NEW YORK

also myths about the gun-man and the bucker-up, brothers named Bowers from some South Carolina town. They are said never to speak. Even in a profession where no man is able to speak, their silence stands out. The catcher is George Smith, a New Yorker. There are no stories about George.

The actual process of riveting is simple enough—in description. Rivets are carried to the job by the rivet boy, a riveter's apprentice whose ambition it is to replace one of the members of the gang—which one, he leaves to luck. The rivets are dumped into a keg beside a small coke furnace. The furnace stands on a platform of loose boards roped to steel girders which may or may not have been riveted. If they have not been riveted there will be a certain amount of play in the temporary bolts. The furnace is tended by the heater or passer. He wears heavy clothes and gloves to protect him from the flying sparks and intense heat of his work, and he holds a pair of tongs about a foot-and-a-half long in his right hand. When a rivet is needed, he whirls the furnace blower until the coke is white-hot, picks up a rivet with his tongs, and drives it into the coals. His skill as a heater appears in his knowledge of the exact time necessary to heat the steel. If he overheats it, it will flake, and the flakes will permit the rivet to turn in its hole. And a rivet which gives in its hole is condemned by the inspectors.

When the heater judges that his rivet is right, he turns to face the catcher, who may be above or below him or fifty or sixty or eighty feet away on the same floor level with the naked girders between. There is no means of handing the rivet over. It must be thrown. And it must be accurately thrown. And if the floor beams of the floor above have been laid so that a flat trajectory is essential, it must be thrown with considerable force. The catcher is therefore armed with a smallish, battered tin can, called a cup, with which to catch the red-hot steel. Various patented cups have been put upon the market from time to time but they have made little headway. Catchers prefer the ancient can.

The catcher's position is not exactly one which a sportsman catching rivets for pleasure would choose. He stands upon a narrow platform of loose planks laid over needle beams and roped to a girder near the connection upon which the gang is at work. There are live coils of pneumatic tubing for the rivet gun around his feet. If he moves more than a step or two in any direction, he is gone, and if he loses his balance backward he is apt to end up at street level without time to walk. And the object is to catch a red-hot iron rivet weighing anywhere from a quarter of a pound to a pound and a half and capable, if he lets it pass, of drilling an automobile radiator or a man's skull 500 feet below as neatly as a shank of shrapnel. Why more rivets do not fall is the great mystery of skyscraper construction. The only reasonable explanation offered to date is the reply of an erector's foreman who was asked what would happen if a catcher on the Forty Wall Street job let a rivet go by him around lunch hour. "Well," said the foreman, "he's not supposed to."

There is practically no exchange of words among riveters. Not only are they averse to conversation, which would be reasonable enough in view of the effect they have on the conversation of others, but they are averse to speech in any form. The catcher faces the heater. He holds his tin can up. The heater swings his tongs, releasing one handle. The red iron arcs through the air in one of those parabolas so much admired by the stenographers in the neighboring windows. And the tin can clanks.

Meantime the gun-man and the bucker-up have prepared the connection—aligning the two holes, if necessary, with a drift pin driven by a sledge or by a pneumatic hammer—and removed the temporary bolts. They, too, stand on loose-roped boards with the column or the beam between them. When the rivet strikes the catcher's can, he picks it out with a pair of tongs held in his right hand, knocks it sharply against the steel to shake off the glowing flakes, and rams it into the hole, an operation which is responsible for his alternative title of sticker. Once the rivet is in place, the bucker-up braces himself with his dolly bar, a short heavy bar of steel, against the capped end of the rivet. On outside wall work he is sometimes obliged to hold on by one elbow with his weight out over the street and the jar of the riveting shaking his precarious balance. And the gun-man lifts his pneumatic hammer to the rivet's other end.

The gun-man's work is the hardest work, physically, done by the gang. The hammers in use for steel construction work are supposed to weigh around thirty pounds and actually weigh about thirty-five. They must not only be held against the rivet end, but held there with the gun-man's entire strength, and for a period of forty to sixty seconds. (A rivet driven too long will develop a collar inside the new head.) And the concussion to the ears and to the arms during that period is very great. The whole platform shakes and the vibration can be felt down the column thirty stories below. It is common practice for the catcher to push with the gun-man and for the gun-man and the bucker-up to pass the gun back and forth between them when the angle is difficult. Also on a heavy rivet job the catcher and the bucker-up may relieve the gun-man at the gun.

The weight of the guns is one cause, though indirect, of accidents. The rivet set, which is the actual hammer at the point of the gun, is held in place, when the gun leaves the factory, by clips. Since the clips increase the weight of the hammer, it is good riveting practice to knock them off against the nearest column and replace them with a hank of wire. But wire has a way of breaking, and when it breaks there is nothing to keep the rivet set and the pneumatic piston itself from taking the bucker-up or the catcher on the belt and knocking him into the next block.

Riveters work ordinarily eight hours a day at a wage of $15.40 a day. They are not employed in bad or slippery weather, and they are not usually on the regular pay roll of the erectors, but go from job to job following foremen whom they like. There is no great future for a riveter. A good gun-man may become an assistant foreman, a pusher, whose duty it is to keep the various gangs at work. But pushers are only used for such work on very large jobs.

It would perhaps be more accurate to say that a riveter's future is not bright at all. The rates charged for compensation insurance are generally accepted as the best barometer of risk. Starrett Brothers & Eken fix, in their insurance department, a rate of

SPIDER

How to get to be a riveter. But don't fall first.

$23.45 per $100 of pay for erecting and painting steel frame structures. Rates of other companies run to $30 per $100 of pay. The only higher rate is for wrecking work. The next lower rate ($15.08) is for building raising. Masonry is $6.07 and carpentry $4.39. Figures on industrial accidents published by the U. S. Department of Labor bear the same connotation. In one year the frequency of accidents, per 1,000,000 hours' exposure, was 228.9 for fabricators and erectors as against 54 for general building.

There was an adage at one time current to the effect that it cost a life to a floor to build a skyscraper. The computation may have originated with a famous downtown building of fifteen years ago in which, with the steel at the fifth floor, five deaths had already occurred. (The Travelers Insurance Company, called in to take over the insurance in that case, made a study of the conditions of the job, recommended certain changes, enforced its own supervision, and saw the remaining thirty-two stories built with but one more fatality.) Or the saying may have arisen and may have been true in the days of ten-story skyscrapers. But to apply it, like the architect's 6 per cent fee, to seventy-story buildings would be pure extravagance. Nevertheless a bloodless building is still a marvel. Five Hundred Fifth Avenue, which has had no deaths to date, is used as an object lesson for builders by the insurance companies, and the Chrysler Building, which was built with the loss of one life, was awarded a certificate of merit by the Building Trades Employers' Association. Four men were killed on The Manhattan Company job, and five were reported to have been killed on the Empire State by the middle of July. In general, deaths run from three to eight on sizable buildings. These figures, in the opinion of the Travelers company, are excessive. The Travelers would allow a builder two at the most.

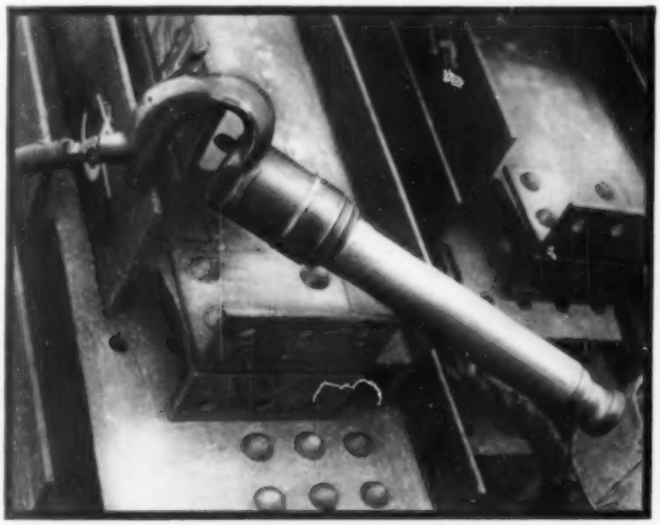
Such accidents are of course expensive, but injuries short of death are more costly. Liability of $875,000 for deaths was incurred in the building trades in the New York district in the last six months of 1928, and $3,145,586 for deaths and injuries. The total of both for the same period in 1929 was $3,885,881.

The safety campaign in the construction industry is blocked by various causes of which the novelty of skyscraper construction and the prevalence of shoestring construction projects are two of the most obvious. More important than either, however, is the attitude of construction workmen. Their trade inures them to danger and they are, as a class, as willing to take risks for others as for themselves. A riveter who has seen three or four hundred red hot rivets a day kept off the heads of the members of the Stock Exchange by an old tin can gets used to the idea. In a recent accident case a man had been injured in the street by the fall of a hammer in use on a building half a block away. No possible wind velocity would account for the drift. The only explanation was that the hammer had been thrown from one man to another. And had missed.

TOOLS

A riveter's gun will strike 1,000 blows a minute.

AROUND the walls of an Egyptian tomb there will be paintings of the workmen and the tools employed in its construction:



THE CRICKET

You have heard them in the metal on a bright day. This is what they look like. Thirty-five pounds. Bright steel barrel. Sanded steel grips. Trigger on the handle. Rivet set upon the business end.

carpenters with their adzes and masons with their trowels. FORTUNE in the photographs presented with this series attempts a similar record of skyscraper construction. There are obvious differences in the manner. And there is one difference in the matter which is sufficiently striking. Certain of these photographs are photographs of machines without their men.

The reason is not merely that some modern tools are practically automatic. The reason is that certain tools used in skyscraper construction are more necessary to the work than any man and are of the first and most dramatic importance to a representation of the process.

The Steel Erector's Derrick.—These unequal scissors that open and close against the sky and haul themselves up by their arms like iron crabs, two stories at a time, are really the builders of the metal work. Their mechanism is simple and their principle is of ancient date. A three-part boom of latticed steel, spliced together by bolts to a length of seventy-five or a hundred feet, hinges to the base of a mast fifteen feet longer. The mast is guyed by eight or ten steel cables. A fall line reeved through pulleys at the end of the boom raises and lowers the load, and a topping lift from the boom's end to the mast top narrows or widens the angle between the two. All this, substituting wooden spars for steel, was commonplace to the Egyptians. But in operation the whole scene is changed. An engineer on the skeleton steel of the tenth floor, obeying the tinkle of an electric bell and seeing nothing of what he does, swings the boom of a derrick on the thirtieth out over the street, lowers away on his fall line, picks a girder cleanly off a truck at street level, raises it and swings it as neatly into place as a watchmaker assembling his microscopic parts. To an observer on the thirtieth floor, the derrick seems to act of its own will. And when, as on the Empire State Building, a company of five or six are in action together on the top of the standing steel, the illusion is complete. Thirteen Clyde derricks were gathered for that job. At Forty Wall, Levering & Garrigues, who build their own, had five working at one time. An unrigged derrick costs $3,800, a rigged derrick $5,000, and a derrick engine $4,500.

Steam Shovels.—These are now usually gasoline shovels because the steam rig requires a licensed engineer to fire the boilers. But actual steam shovels were used on the Forty Wall site. A modern shovel costs about $14,500. It can dig a yard and a quarter, water measure, at a thrust. Excavation is paid for by the cubic yard, the price running from $3.50 for earth at five feet depth to $13.50 at thirty feet. But hard rock costs $10 at five feet.

A shovel crew is made up of the engineer and his helper. The helper stands in the pit. The engineer sits in the box car on the caterpillar treads and works his levers. His car can move in every direction save skyward. He pulls the swing lever and rotates his shovel to the bank where he intends to dig. He lowers the boom. Another lever manipulates the crazy elbow of the crowding device and jabs the shovel forward. The engine quivers. The car, balanced by its five ton counter weight, heaves forward on its caterpillar treads. The shovel rises, spilling the loose loam. If the excavating is being done at a considerable depth the shovel will be emptied into a dipper dropped from a hoisting derrick standing at street level. The hoisting derrick is on a circular platform over the pit. On the platform stands the hoist engineer's apprentice watching the steam shovel and the two laborers who work with

Sweat

In advertising, as in industry, successful production is accompanied by sweat. Sweat purges advertising of the sins of superficiality—hair-trigger conclusions, sketchiness, conjecture, misdirection, hunches, necromancy. Sweat carries away the fat, leaving the bone and sinew of an idea. One of the principles on which this agency was founded is this: that only by working harder than the other fellow—by digging deeper for ideas—can outstanding advertising be created. In seven and a half years, Young & Rubicam has never sought a short cut.

YOUNG & RUBICAM · INC·

ADVERTISING

NEW YORK · PHILADELPHIA

it. He gives the engineer the signal to raise. The engineer sits beside his engine on a wooden bench in a temporary shed twenty feet from the derrick, the derrick cables winding and unwinding on his drums. He works three levers with his hands and two with his feet. At the signal of his apprentice's hand, which he must always watch, the hoist bucket swings clear and pulls out of the pit. The derrick circles until the bucket hangs above a waiting truck. A workman on the truck guides it. It opens. The earth spills out. The truck driver folds his *Graphic* and jams his engine into gear.

Riveter's Gun.—One similar to those employed in skyscraper construction will strike something under a thousand blows with a three or four pound steel slug per minute. A workman who could strike sixty similar blows in a minute would be an excellent workman, and he wouldn't last long. Which may not justify riveters' guns to the citizens of New York or Chicago or Houston. Asking such people to admire a riveter's gun is like asking Marie Antoinette to admire the efficiency of the guillotine. But which, nevertheless, does justify them. With carrying charges in skyscraper construction running into thousands of dollars a day and penalties for tardy completion involving sometimes the loss of the better part of a year's rent, no man could afford to build a skyscraper without riveting hammers. And until electric welding is made safe for buildings over ten or twenty stories, the citizens of New York and Chicago and Houston will simply have to like the noise.

A riveter's gun is a steel tube with a steel plug at one end and a handle at the other. The steel plug is held against the rivet head. A free plunger is driven back and forth in the tube by compressed air. The air supply is controlled by a trigger attached to the handle.

Guns of this type cost about $65 and are owned by the erectors. Air compressors of the stationary type used on Forty Wall are rented by the builder for the job. They cost originally $1,600 and each compressor feeds, by metal tubes and hose leads, eight or nine guns, providing each with thirty-five cubic feet of air per minute. Fifty guns were in use on that job at one time. Costs of operating including labor run to forty or fifty cents a rivet, the average number of lighter rivets being 400 a day and of heavier rivets 200.

ED RADIGAN

Portrait of a prize-winning laborer.

THERE are two things about Ed Radigan. One is that he got the Certificate of Superior Craftsmanship (with Gold Button) for structural iron work on The Manhattan Company Building at Forty Wall Street. When a great skyscraper is near completion the New York Building Congress gives out its awards for the best work done in each of the various trades. The laborers nominated by their foremen gather in the lobby of the building with its unfinished bronze and marble and its painters' scaffolds and its dangling lights. The owner comes in. Some dignitary from the builder's office makes a suitable speech. There is a round of appropriate applause. And the buttons are handed out.

The other thing about Ed Radigan is that he has had a fine life. He has had the kind of life only a steel worker, and only a steel worker in America, could have. Since he was sixteen he has worked the noble metal and seen the world. He has seen Mexico and France and California and Oklahoma and Philadelphia and Cabin Creek. He has handled boilers and pipe and beams. He is

ED RADIGAN

A steel-working man, a rod-rider, a doughboy, and a gob.

thirty-eight years old. He is quick on his feet, heavy-set, tall, active, a good drinker, a great talker, a very strong, reckless eloquent man. And he loves steel.

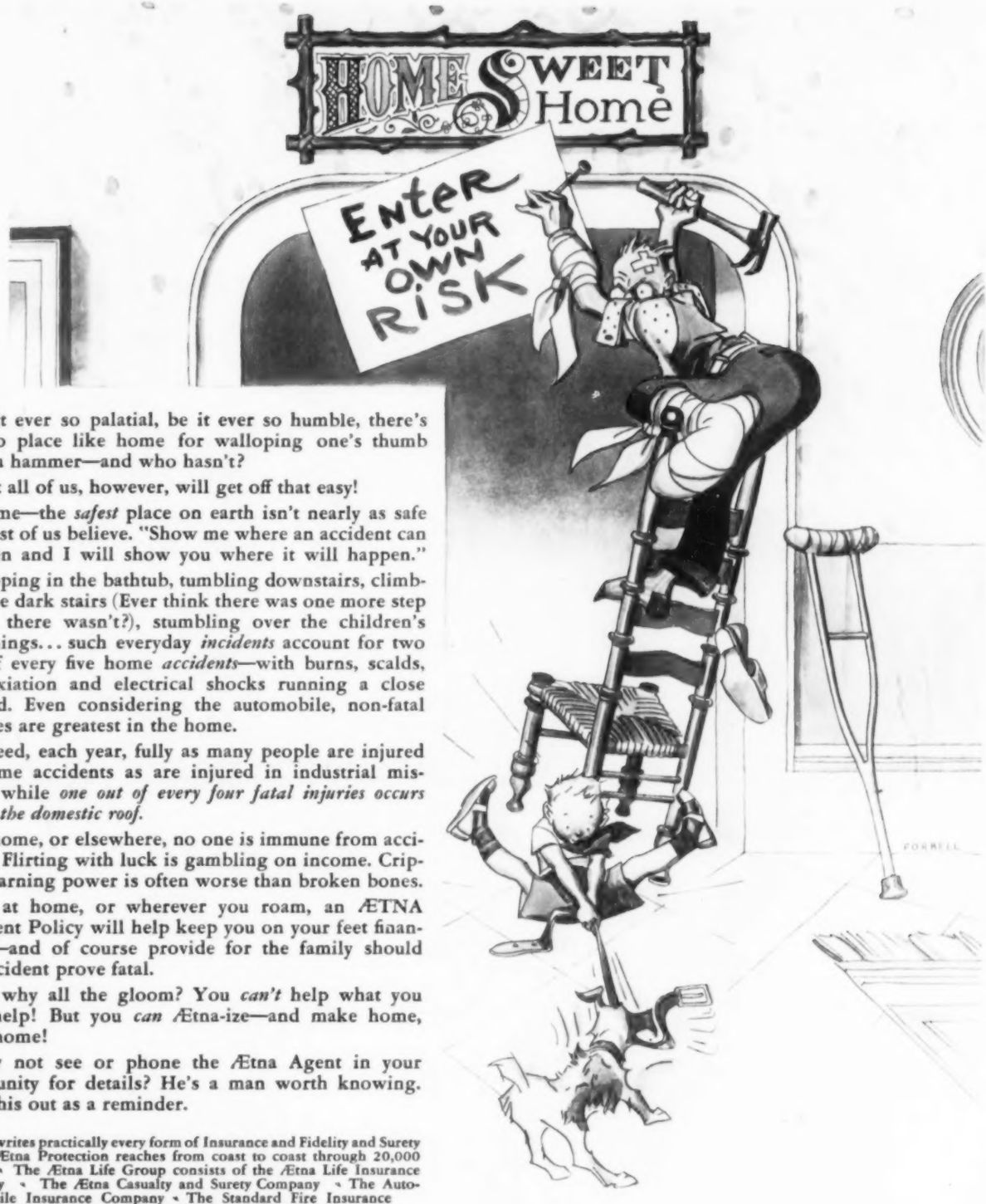
He started working it in Providence in 1908. He lived in Providence with his father, "the grandest Irishman in the whole of America," and he went to school in Providence. After school he took to pipe fitting. But like most men with a calling in life, he was at first obstinate. He went to sea. For three years he worked oil tankers up and down the coast—from Boston to New York to Savannah to Tampico, coasting the Florida Keys in the long procession of ships that edges in from the Gulf Stream current to the Barrier Reef, watching Dry Tortugas and its light go under. His first ship was the Texas Oil Company's *Louisiana*. He was an oiler on that run. His second ship was the *Magnolia*. He was a deck hand on the *Magnolia*. When the *Magnolia* put in at Port Arthur, Texas, he left her and tried the town. The result of that was a quartermaster's job on the Texas Company's *Dallas*. The *Dallas* put in at Tampico, crossed the Gulf, ran north and east with the green water, and ended up at Portland, Maine. At Portland, Radigan left the sea. He was twenty, he had been roving a long time, and at last he knew what he was going to do. He was going to work at steel.

His first jobs were on boilers and tanks. The tanks carried him by train across the states to Oklahoma. For a long time, in Tulsa, in Cushing, in the small towns of that country he followed his trade, riding the rods from one freight yard to another or getting lifts on trucks. Once he rode the rods from Cushing, Oklahoma, to Casper, Wyoming. He learned to rivet, to lean in on the gun with the slippery barrel in one hand and the air trigger against the other palm, to get his buttons even on the rivet end. Finally he went east. He was foreman on an oil tank job at Perth Amboy. He did boiler work in Fall River, taking the old side-wheeler up through Hell Gate and Long Island Sound. And finally the War overtook him. He was drafted from Providence, sent to the Seventy-eighth at Camp Dix, and shipped to France. In France he saw a bit of St. Mihiel and the Argonne and learned the doughboys' first lesson, which was to drink cognac in small glasses. He liked the War, too. It wasn't such a change from steel.

Radigan's first taste of derrick work was at Kittery, Maine, on the bridge from Portsmouth to Kittery. Since then he has done derrick work and riveting on building construction jobs up and down the Atlantic seaboard. When he rivets, he holds the gun. He doesn't catch, and he doesn't heat. He drives them in. When he is on derrick work, he is a connecter—out on the ends of the groggy steel screwing the temporary bolts in while the derrick cable holds the member on which he is working. At Forty Wall he was a connecter. It was fine work. There was a lot of steel. And a lot of men handling the steel. There were about 16,000 tons of steel and five crews to lay the lot of it.

So far as the risk goes—he was a year in France, three or four months at the front, and they didn't touch him. And he has swung out over the streets of half a dozen cities on a derrick fall with nothing to show for it. But riveting is different. Once the ropes holding the riveters' platform broke, and once in freezing weather after a fine rain he slipped on a scaffold and went down. That time he fell four stories. They picked him up with a broken arm and a broken leg, and it took four months in the hospital to fix him.

The rest of Radigan's story is the domestic part. Its outlines are familiar. You can't rove forever. He is married. ("Yes," he says, "and badly.") He has a Rickenbacker car, no children, and a two-family house in Providence. When he can't work steel, he'll live in the other half. Maybe.



BE it ever so palatial, be it ever so humble, there's no place like home for walloping one's thumb with a hammer—and who hasn't?

Not all of us, however, will get off that easy!

Home—the *safest* place on earth isn't nearly as safe as most of us believe. "Show me where an accident can happen and I will show you where it will happen."

Slipping in the bathtub, tumbling downstairs, climbing the dark stairs (Ever think there was one more step when there wasn't?), stumbling over the children's playthings... such everyday *incidents* account for two out of every five home *accidents*—with burns, scalds, asphyxiation and electrical shocks running a close second. Even considering the automobile, non-fatal injuries are greatest in the home.

Indeed, each year, fully as many people are injured in home accidents as are injured in industrial mishaps, while *one out of every four fatal injuries occurs under the domestic roof.*

At home, or elsewhere, no one is immune from accidents. Flirting with luck is gambling on income. Crippled earning power is often worse than broken bones.

But at home, or wherever you roam, an ÆTNA Accident Policy will help keep you on your feet financially—and of course provide for the family should the accident prove fatal.

But why all the gloom? You *can't* help what you can't help! But you *can* Ætna-ize—and make home, *sweet* home!

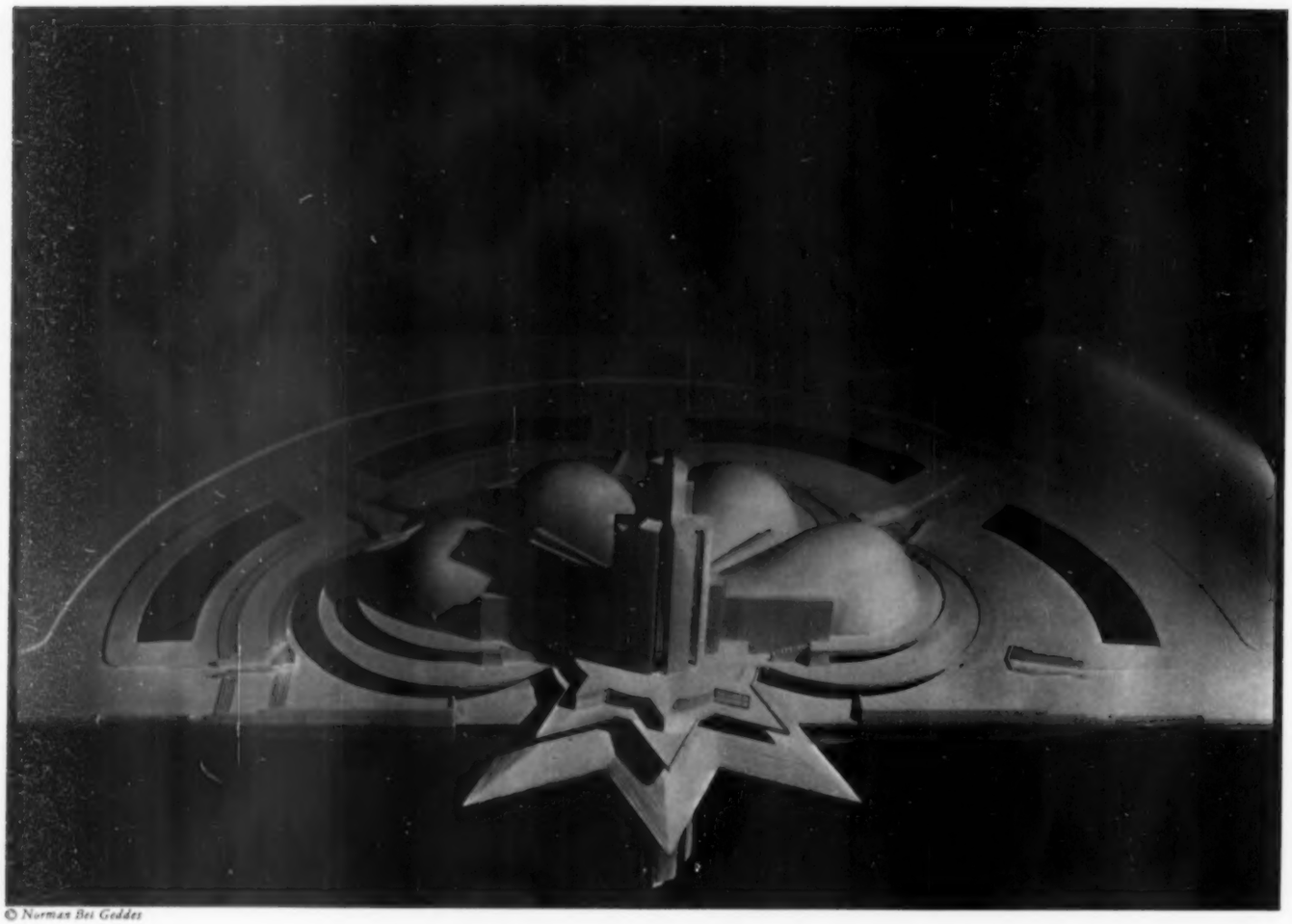
Why not see or phone the Ætna Agent in your community for details? He's a man worth knowing. Tear this out as a reminder.

Ætna writes practically every form of Insurance and Fidelity and Surety Bonds. Ætna Protection reaches from coast to coast through 20,000 agents • The Ætna Life Group consists of the Ætna Life Insurance Company • The Ætna Casualty and Surety Company • The Automobile Insurance Company • The Standard Fire Insurance Company of Hartford, Connecticut.

ÆTNA

ÆTNA-IZE

SEE THE ÆTNA-IZER IN YOUR COMMUNITY - HE IS A MAN WORTH KNOWING



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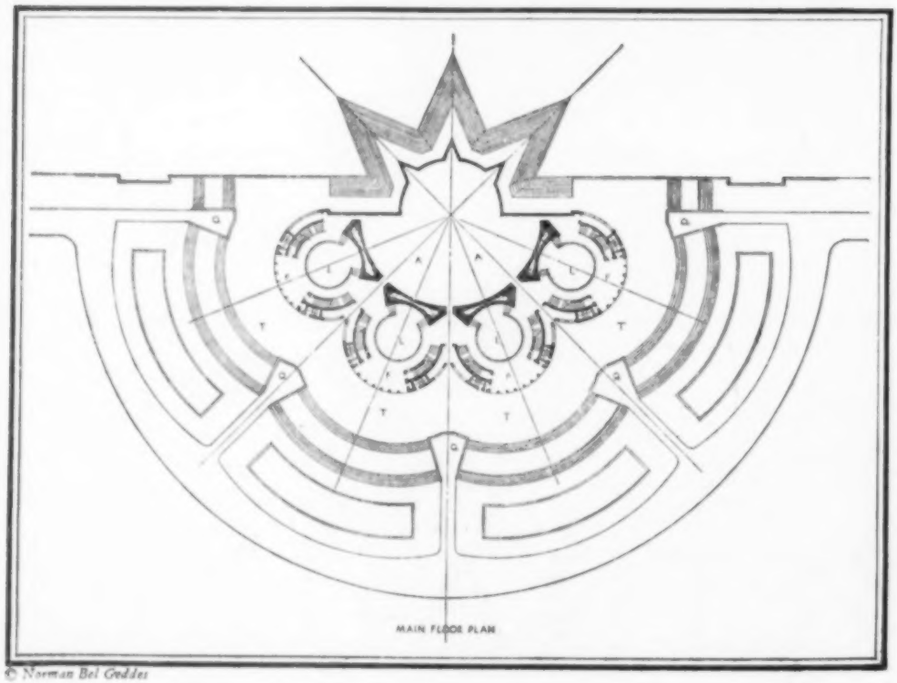
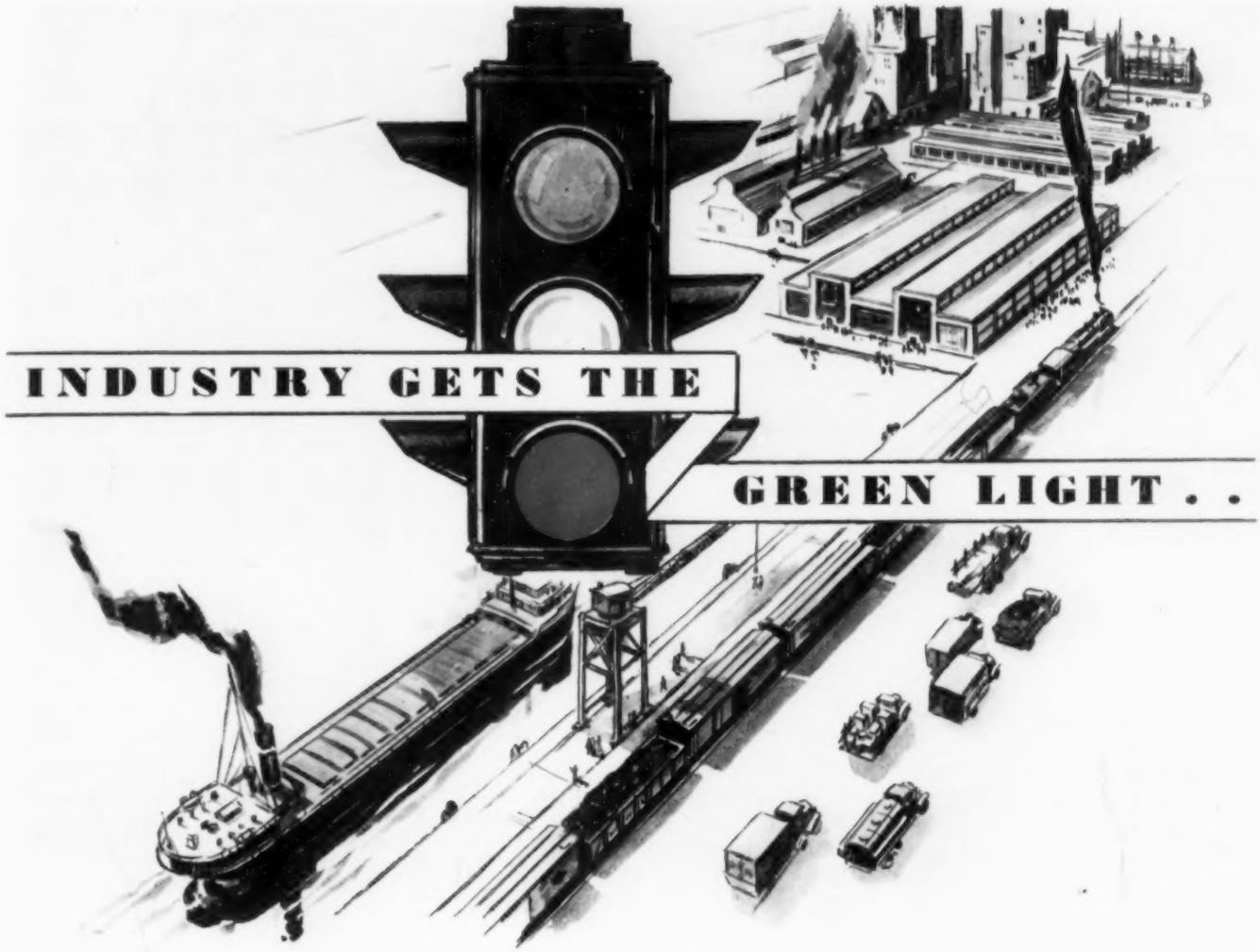


© Norman Bel Geddes

PLANS FOR A "TEMPLE OF MUSIC" AUDITORIUM PROPOSED FOR THE CHICAGO WORLD FAIR

Norman Bel Geddes, brilliant stage designer and architect, factually describes the above-planned structure as "an auditorium for various sized audiences that may be enclosed or open air, with a tower for carillons, rehearsal rooms, studios, offices, and dressing rooms." The auditorium has a seating capacity of 10,000 persons, an orchestra of 200 pieces, and a chorus of 600. Built without posts or balconies, the auditorium is in four sections, each enclosed by its own dome, which may be open or closed. Partitions close off the various portions so that the size of the audience may be reduced to 1,200 persons. There are terraces, the studio-and-office carillon tower, and docks for those who arrive by water. The basement is capable of holding 1,720 parked automobiles. Four lanes of traffic make it possible for 100 cars to unload per minute.



Bears are pulling their punches and signs are now seen here and there of a quickening of the industrial tempo . . . automotive plants are swinging back into line . . . even basic industries are getting under motion. The new drive is on!

That you may make the most of industry's upswing, you had best take careful stock of your present facilities, keeping in mind that proof of the plant is profit . . . that obsolescence in equipment and methods are serious drags upon earnings and a source of constant waste.

If indeed, you *do* have a white elephant on your hands, now is the time to scrap it because the cost of building is lower than it has been for years . . . there never has been a better time to strengthen the weak spots in your industrial armor.

By enlisting Austin Engineers you are assured that good engineering, always worth many times its cost, will arm your new manufacturing facilities with the best in design . . . with efficient layout for straight-line production. Subsequent savings in operating costs will make profit margins possible.

Distribution costs can likewise be lowered by branch plants, warehouses or display facilities . . . for "spot stocks" are vital in these days of low inventories . . . the man who can deliver first gets the order.

To any problem of design and construction, whether it be a single warehouse or a complete industrial plant, the Austin-Method* brings practical economies in design, which make possible low-cost construction and reduced building investment.

THE AUSTIN COMPANY

THE AUSTIN METHOD

***The Austin Method of Undivided Responsibility**

Is a merging of the functions of architecture, engineering, construction and equipment into one integral service . . . you cover the entire project by the terms of a single contract. Low total cost, high quality of workmanship and materials, and a definite completion date guaranteed . . . bonus and penalty clause included if desired. Your requirements are answered by completed facilities, delivered broom-clean, ready for occupancy. A service localized through 16 Austin offices — Coast to Coast.

ENGINEERS AND BUILDERS . . . CLEVELAND

The Magnificence of Morgan

Is lost in the mutual misunderstandings of business and letters.

IN the 1,063 pages of the *Oxford Book of English Prose*, some 315 excellent writers of English and several accomplished composers of Latin prose treat of almost every subject in the world. Except one. Between 1326 and 1915 these chosen gentlemen with practical unanimity neglected to mention business. On page 825, however, Author No. 224 does so, with two paragraphs in description of the kind of man who interests 1930 more than any other:

> I can imagine nothing better in theory or more successful in practice than private banks as they were in the beginning. A man of known wealth, known integrity, and known ability is largely entrusted with the money of his neighbors. The confidence is strictly personal. His neighbors know him and trust him because they know him. They see daily his manner of life, and judge from it that their confidence is deserved. . . . Even in large cities, as cities then were, it was possible for most persons to ascertain with fair certainty the real position of conspicuous persons, and to learn all which was material in fixing their credit. Accordingly the bankers who for a long series of years passed successfully this strict and continual investigation, became very wealthy and very powerful.
>
> The name "London Banker" had especially a charmed value. He was supposed to represent, and often did represent, a certain union of pecuniary sagacity and educated refinement which was scarcely to be found in any other part of society. In a time when the trading classes were much ruder than they now are, many private bankers possessed a variety of knowledge and a delicacy of attainment which would even now be very rare. Such a position is indeed singularly favorable. The calling is hereditary; the credit of the bank descends from father to son: this inherited wealth soon brings inherited refinement. Banking is a watchful, but not a laborious trade. A banker, even in large business, can feel pretty sure that all his transactions are sound, and yet have much spare time. A certain part of his time, and a considerable part of his thoughts, he can readily devote to other pursuits. And a London banker can also have the most intellectual society in the world if he chooses it. There has probably very rarely ever been so happy a position as that of a London private banker; and never perhaps a happier.

This little aside in Walter Bagehot's general essay about business is the only respectable sketch of the late John Pierpont Morgan that has ever been written. And it was done by a scholarly amateur of affairs who had never heard of Morgan, at a time when the latter was an apprentice clerk just out of a German university.

What can we read about Morgan today, seventeen and one-half years after his death? *Morgan The Magnificent, The Life of J. Pierpont Morgan*, by John K. Winkler, just off the press called Vanguard ($3.50), is not by any means trash. It is informative, bright, rapid of pace. The Connecticut atmosphere of the ancestors and of Pip Morgan's childhood is pleasantly communicated. The London clerkship, the arrival by packet in the Manhattan of 1857, the "Western Blizzard" panic of that tragic year, the queer little deal in 2,500 Civil War carbines and its suite of famous "Deadhorse" claims, the youthful speculation in gold, the impetuous marriage to the dying Amelia Sturges—Mr. Winkler has dug it out of the old newspaper gossip files and tattle books pretty thoroughly. He is not a bore. But he is also not a biographer. He is a Hearst newspaper man who retired from sixteen years of star anonymity to the instant recognition of the magazine article business. It is not remarkable that he does not do it better, but it is astonishing that with his baggage he can do it at all.

• • •

Mr. Winkler's effort simply goes to confirm the sad fact that the most colorful figures of modern America are fading from the public memory, leaving behind nothing but bad portraits and indifferent biography. There are enough books. There are little scandal sketches about the crookeder side of Wall Streeters. And there are enormous, fatuous encyclopædias, made or in the making by ghost-writers who slumber under the easy censorship of vanity. But there is no real analysis and no real writing. The true literary world will have none of business. Why?

One must listen to this learned world first:

I.—There are no properly equipped historians in America who know anything about business. Our economists and sociologists are outlandishly theoretical and naïve. They are doctrinaire to a man. Veblen's famous "idle curiosity" which is the scientific spirit was Norwegian like Veblen. Social workers cannot discover the history of barter, usury, and promotion. Such professors as we have are ladies on this battlefield. The milk and water of our new politics is their fare.

II.—The Yankee business world has had a tendency, now passing, to organize itself against any such foolishness and danger as literature. How is a scholar, helpless without original sources, to do any research? There are no original sources. Business men don't keep any. They burn them up, if there are any at all. Look at Wall Street windows late of a winter afternoon. Through pane after unending pane along the vita-glassed canyons one sees conferences, tables packed close with men talking, nobody writing down anything. When they are not talking to each other, they are telephoning. It is a great waste of time to write anything; it is also dangerous. Even the Stock Exchange keeps no record of its transactions.

III.—The talented commentators, critics, writers who were born into business or who have drifted into it by accident are bought up and snuffed out. The only two unlearned professions in the U. S. which pay better than that of the salesman are those of the ghost-writer and the press agent. There are authors of orations and editorial articles by trust company presidents whose daily stipend is greater than the monthly honoraria of serious literary persons.

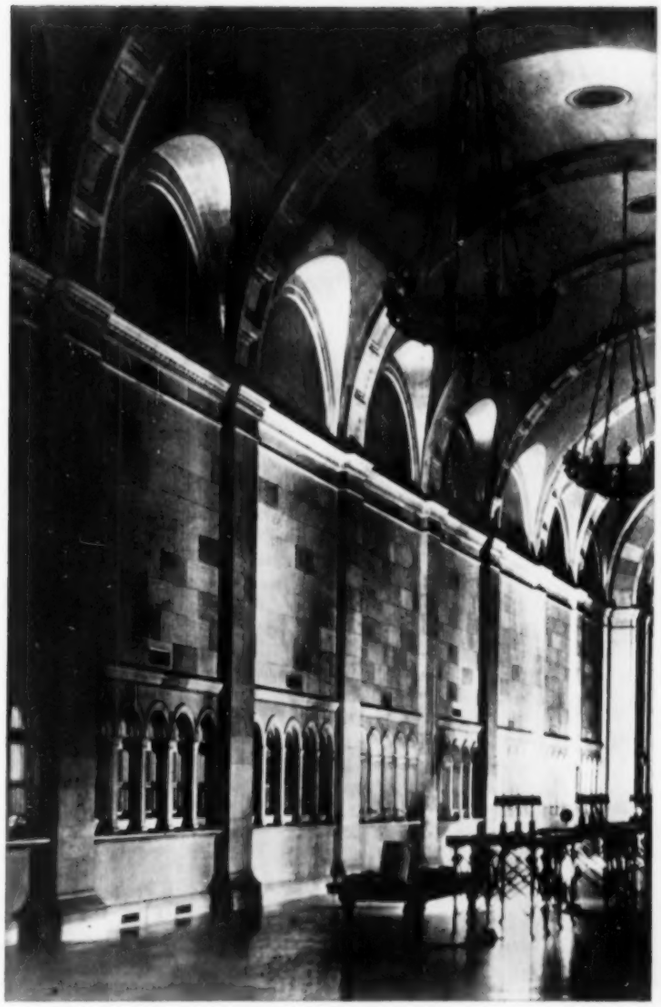
What does the business world say about history and biography?

I.—Publicity means favorable publicity. Uninstructed scrutiny of business is destructive, not constructive, because it unsettles the social state. It provokes ignorant hatred, aggravates dangerous tendencies, changes nothing, does nobody any good.

II.—To pay to have anything written about one's self or one's business is vulgar. It is excusable only in a man so senile that he thinks he is holding up an example to youth and posterity. To allow anybody to find out anything about one's affairs or one's career, or that of an ancestor, is bad taste and dangerous. A gentleman exposed to the harsh light of letters is a gentleman gone wrong.

• • •

These are only a few random reactions, as they say so clinically in business. Mr. Winkler knows them all. The Morgan family certainly did not help him with any clippings. Previous books did little for him. His industry in the old newspaper files was enormous. The only oral material that he picked up was about the mistresses, previously unpublished. Here his copy has been properly checked by a libel lawyer; the only ladies he names are dead. His financial knowledge is small, which is all right. He has evidently not been down to Wall Street for a great many years, for he thinks that the House of Morgan still inhabits the old funny building, which was a charming structure. He admires Morgan in a horrified kind of way, but he has no understanding of the profoundly Prussian nature of the old man. A mathematician from Bismarck's own university with a flair for the arts is a difficult piece of newspaper reporting, after all. The most prodigious of recent creatures will have to wait for a biographer with race, baggage, and temperament. Some yet unborn American Voltaire will have a lot of fun with the subject.



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New England's oldest and largest financial institution, with which a majority of the banks in this territory carry their accounts.

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Maksoud of Kashan

[*Continued from page 50*]

was one of the great events of the century in its effect on Western taste.

Rare

If nothing were known of Italian painting prior to the year 1800 but the names of three painters and if only three canvases existed which could possibly be attributed to a period earlier than the 15th century and if only a few pictures remained from the 15th century itself, Italian painting would be about as common as Persian rugs. The centuries of Persian greatness and the centuries of Italian greatness do not, of course, coincide. But the reference to Italy is not too far-fetched. Tamerlane, second Mongol conqueror of Persia, died in 1405. In 1502 Shah Ismael, of the family of the Sefavids, defeated the Turkomans and founded a new dynasty in Persia with his capital at Ardebil east of Tabriz and near the Caspian. His son, Shah Tamasp, fixed the capital at Tabriz. And his grandson, the great Shah Abbas who finally expelled the Turks, set up his royal city at Ispahan. From 1586 to 1628 he ruled the ancient kingdom of Iran. He was the "Great Sophy" to whom Elizabeth sent her ambassador and from whom she received gifts. He sent into Italy for painters and architects, and the work of Italian hands is still to be seen in the Palace of the Forty Columns at Ispahan. Under his rule the arts of poetry and weaving flourished. And with his name is still associated every decent bridge and sound piece of ancient road in the empire. If Persia had no Quattrocento, at least its golden age did not lag far behind the great age of Italian painting.

And it is true that only three names of master weavers remain to us. In a panel of the superb carpet from the Ardebil Mosque now in the Victoria & Albert Museum, there is an inscription which reads: "I have no refuge in the world other than thy threshold: my head has no protection other than thy porchway; the work of the slave of the holy place, Maksoud of Kashan, in the year 946." The year of the hegira 946 is the year 1540 after the birth of Christ. The rug was therefore woven during the closing years of the reign of the Shah Ismael. But of its weaver, other than the fact that he could quote Hafiz and was a master of all masters in his art, nothing is known. "Thy slave," is *votre service* in Persian. Two other rugs are similarly signed, one, in 1542 by Ghiyath ed-Din Jami and the other in 1661 or 1671 by Ni' met-ullah of Joshaghan. Of early rugs themselves, two of the oldest, formerly the property of the late C. F. Williams of Norristown, Pennsylvania, were in the Metropolitan Museum in New York. And the first rug reproduced herewith is an extremely early piece from the collection of Mr. Vincent Robinson of London, bought by the Metropolitan Museum at the Yerkes sale.

Not only are Persian antique carpets rare at the moment. They will continue to be rare. There are no more where these came from. Most of the great mosques but the mosques of Kum and Kerbela have been robbed of their rugs and private owners who had rugs worth selling have, for the most part, sold them. It is possible that some out of the way village may discover a pair or so of old pieces, but it is quite certain that the market will never be flooded with such finds. And so far as the modern manufacture of Persian rugs is concerned, the collectors have little to fear from that source. Modern rugs are now made in Persia to the order of European and American sellers on designs specified by the seller ("Our number 806: color—our combination number 731"). The wools are for the most part English in origin. The dyes are largely of Western manufacture and some yarns are sent into Persia for weaving already dyed. Continual oversight is maintained to see that the peasant weavers follow the designs given them—i.e., to see that they make no innovations or alterations such as their own Persian sense of rug weaving might suggest. And the finished product, once delivered in New York, is sent over to Hoboken for an acid bath which will give the colors that old rich sheen so much admired on Park Avenue. After which (if the colors have stood the bath, or after a bit of touching up with pigment and glue if they haven't) the rug is ready for sale. Not even the newest rug fancier would be fooled by it.

The big books

The serious objection to the egg as a collectioneer's object is neither its cheapness, its commonness, nor the way it resembles itself. It is the fact that there is so little to be said about it. And it is on that score that the Persian rug really establishes its superiority. There is everything to be said about Persian rugs. Enormous volumes have been written saying it. And when it is all said, additional information from within the Mosque of Kum may make it necessary to unsay it all and start again. The great point of controversy is, of course, the identification of particular pieces. But the identification of pieces involves a knowledge of the categories of rugs, a knowledge of the knots, wools, dyes, and designs employed locally in the various rug-weaving sections of Persia, and a considerable knowledge of the invasions and the migrations affecting the life of those districts. The categories alone are sufficiently complicated. They are usually given geographically as follows: Herats, Khorassans, Mesheds, Ispahans, Kirmans, Yezds, Shiraz, Niris, Feraghans, Hamadans, Irans, Sarouks, Kashans, Sarabends, Burujirds, Sultanabads, Muskabads, Joshaghans, Sehnas, Bijars, Kermanshahs, Western Kurdistans, Persian Kurdistans, Karajes, Tabriz, Gorevans, Bakshis, Serapis, Herez, Suj-Bulaks, Karadaghs, Mosuls. But those titles are too precise to be accurate. A rug may be known in one country by the place where it is ordinarily marketed and in another by the name of the place where it is made. Mr. Pope therefore catalogues his rugs thus:

(1) A small group of severely designed medallion carpets from northwest Persia dating from the earliest part of the 16th century.

(2) Carpets from Kashan and the west of Persia dating from the 16th century. The famous Ardebil carpet is of this group.

[*Continued on page 102*]

The World's Greatest Persian Rugs

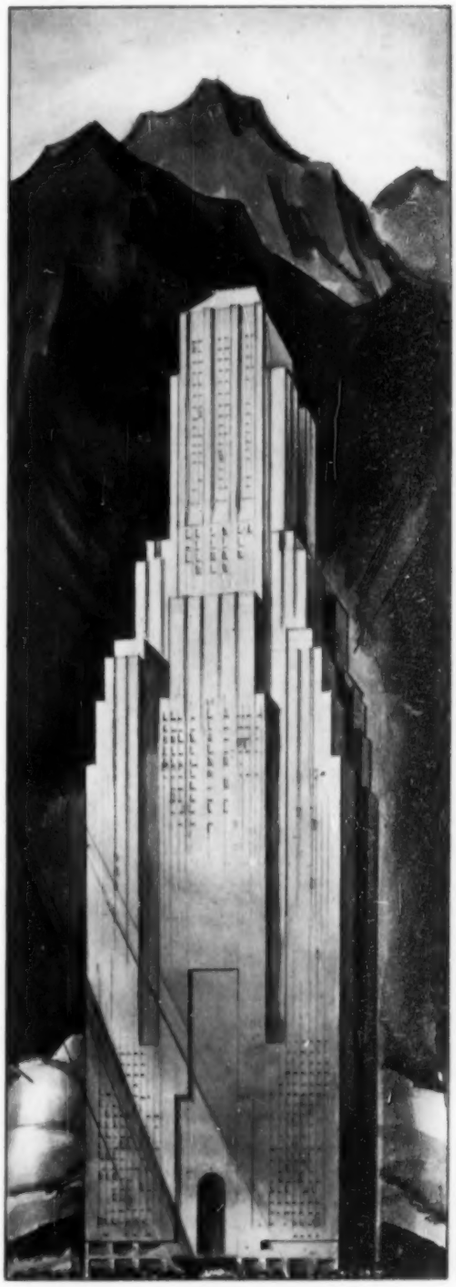
Arthur Upham Pope's selection of antique pieces

Great hunting carpet	Austrian State Collection
Its near mate	Baron Maurice Rothschild, Paris
Ardebil carpet	Victoria & Albert Museum
Animal carpet—red and dark blue	Victoria & Albert Museum
Great hunting carpet	Milan, from the late Queen Mother's collection
Behar carpet and its mate	Mrs. McCormick and Austrian Museum
Tree carpet	Estate of Mr. C. F. Williams
Medallion and animal carpet	Clarence H. Mackay
Its mate	Kaiser Frederick Museum
Another medallion with hunting scenes	Rosenborg Castle, Sweden
Animal carpet	Poldi Pezzoli, Milan
Animal and tree carpet	Princess Schwartzenberg, Vienna
Vase carpet	Edith Rockefeller McCormick
Vase carpet	Kunstgewerke Museum, Berlin

To which must be added the most famous of all rugs, the "Spring of Chosroes," a carpet 106 feet by 106 feet, woven in the 6th century for Chosroes I, Emperor of Persia, and cut to strips by the Arabs in 637 A. D. when they captured Ctesiphon. It was of silk, gold, precious stones, and silver and represented a pleasure ground with brooks and paths and trees and flowers. "The stalks of the trees were of gold and silver, the leaves and flowers of silk, the fruits of many coloured stones."

The SKYSCRAPER . . .

is so much Steel and Stone without Electricity



The cold, dark mass gradually rearing its head mountain-high on a busy down-town corner is a building—an impressive tribute to modern construction skill. But it cannot become a revenue-producing property—a busy office, a theater, or a luxurious hotel —until electricity has made it so. It is electricity that gives a building *life.*

Because of electricity, water flows hundreds of feet above surrounding levels, heat and fresh air circulate to inside, windowless rooms. On dark nights and sullen days electricity scatters sunshine throughout every nook and corner. Swift automatic electric elevators whisk you up or down in the twinkling of an eye, yet with a barely perceptible sense of motion.

In every phase of building and building equipment, Westinghouse is co-operating with architects and construction engineers to make steel and stone more serviceable — and more friendly. Westinghouse responsibility runs the entire course from the arc welding equipment that silently knits the structure together to the exterior and interior lighting, motors and control for pumping and ventilating, panelboards, automatic elevators, and electrical appliances of every sort.

Tune in the Westinghouse Salute over WJZ and the coast-to-coast N. B. C. network, every Tuesday evening.

Westinghouse

Maksoud of Kashan

[*Continued from page 100*]

(3) 16th century carpets from eastern Persia. This group includes the carpets known in America as "Ispahans, 16th century," which have long been the most popular of all antique carpets here. Over 1,000 of them are owned by American collectors. It seems to be well established that none of them were woven in Ispahan (but in Herat, in what is now Afghanistan), that few of them were woven in the 16th century, and that the greater number of them are inferior in workmanship and design. Their popularity is poetic—the triumph in commerce of one of the most beautiful names in the world.

(4) Carpets from central Persia: Joshaghan Ghali. This classification includes the small and beautiful group of "vase carpets" woven at Joshaghan Ghali for the palaces of Ispahan under the "Great Sophy." The largest, and perhaps the best of those still in existence, is owned by Mrs. McCormick.

(5) Silk carpets from the court looms of Ispahan—the so-called Polonaise carpets. These latter were exhibited at Paris in 1878 from the Czartoryski collection in Warsaw and owe their name to that accident.

To fit the particular rug into the proper category, the expert weighs the evidence of design, of knot, of tint, of material, etc. For example, the wool of a rug from the high, cold plateau country north of Shiraz (the divide, say, where the village called the Village of the Willow stands) will be good. The hairs will be long and smooth and flexible. Whereas the wool of a rug from the parched, low country will be inferior—harsh, brittle, and short of strand. In something the same way but for different reasons the colors of the rug are significant. Dyeing, in the great epoch, was done by families which passed on their discoveries from generation to generation as trade secrets. There were, therefore, slight differences in tone between wools dyed by one dyer in Tabriz and wools dyed by another in Ardebil. The following recipe for a Persian blue is taken from a manuscript written in India by an emigré who describes himself as the descendant of twenty generations of Tabriz dyers:

> Birbul's Blue. Take cinnabar, indigo, and alum, grind and sift lighter than the light dust of the high hills; soak for ten hours; keep stirring it; put in the wool and soak for many hours. Boil for three hours; wash in kurd water, water in which kurds and whey have been well beaten up; leave for three hours, and then wash and beat again in water.

The ancient dyes were, as this suggests, vegetable or animal in origin. The principal blues were from indigo. Certain reds were from the plant madder: others from the insect cochineal which lives on the oaks of the Mediterranean country (the females alone were used and 50,000 of them dried would weigh a pound). Yellows were from the leaves of sumach or from saffron, the product of the stigmas of the fragrant crocus. Green was from buckthorn, gray and brown from gallnuts, and reddish brown from henna. It was, and still is, judged that the best blues were Persian, the best reds Turkish, and the best yellows Chinese. And it is quite generally agreed that the colors of the great oriental rugs are the loveliest colors yet produced by man.

The customers

A rug dealer who finds himself possessed of an excellent and authentic piece of 16th century Persian weaving will not advertise his goods. He will write ten letters. And if the ten letters bring no results, he will probably put his rug in storage. The market is as limited as that. Of the few men rich enough to buy great rugs, only a small percentage are interested in rugs of any kind. Of that small percentage, only a fraction will be interested in this particular kind of rug. And of that fraction one or two will not be approachable. Mr. Edsel Ford, for example, does not wish it known that he buys rugs and the dealers are therefore in an agreeable conspiracy to keep him assured of the world's ignorance.

One of the foremost American collectors is probably John D. Rockefeller, Jr. His collection is limited to the so-called Polonaise rugs and the so-called Ispahans and therefore does not include any of the great archaic pieces. But his collection of Polonaises is the finest in the world and of enormous value.

The world's finest collection of Ispahans is owned by Joseph E. Widener of Philadelphia, Rembrandt collector and horseman. Mr. Widener's first purchase is said to have been made at Saratoga. There was a harangue by an Armenian merchant, a purchase by Mr. Widener irrespective of the harangue, and late that day an abrupt departure by the Armenian. "Damn that man Widener," he said. "He bought my decoy."

Edith Rockefeller McCormick's collection has less consistency. She owns the animal carpet from the collection of the Emperor of Austria mentioned above, a famous double-back Shah Abbas carpet, and the best of the vase carpets. But she has not specialized in any one kind of rug.

James F. Ballard, a drug manufacturer of St. Louis, differs from his wealthier rivals in the fact that he collects his own rugs on the basis of his own knowledge. There may be scholars who know more about rugs than Mr. Ballard, but there are few men who have backed their own judgment as he has done. He has traveled over the rug-producing countries, has been a prisoner of war in Adrianople, a witness of Armenian massacres in Smyrna, and the victim of a Turkish mob. And he has built up the best private collection of 18th and 19th century oriental rugs in existence. He has also been extremely generous. In 1923 he invited experts from the Metropolitan Museum to look over his collection and choose the rugs needed to complete the Museum's collection. They took 129 valued at about $400,000. In 1929 he gave seventy rugs valued at $250,000 to the St. Louis Art Museum. And he has recently purchased the collection of V. D. Cliff of Detroit for division between the two museums.

A collection similar to that of Mr. Ballard but considerably less important is that of George Hewitt Myers, banker, of Cleveland and Washington. His Textile Museum of the District of Columbia contains excellent later pieces and a few good Ispahans.

In addition to such collectors as these, there are purchasers of valuable rugs like Andrew William Mellon, Jesse Isador Straus, George Blumenthal, Mortimer Schiff, and Philip Lehman, who can be counted on to buy from time to time. And beyond are the unexploited fields of the newer fortunes.

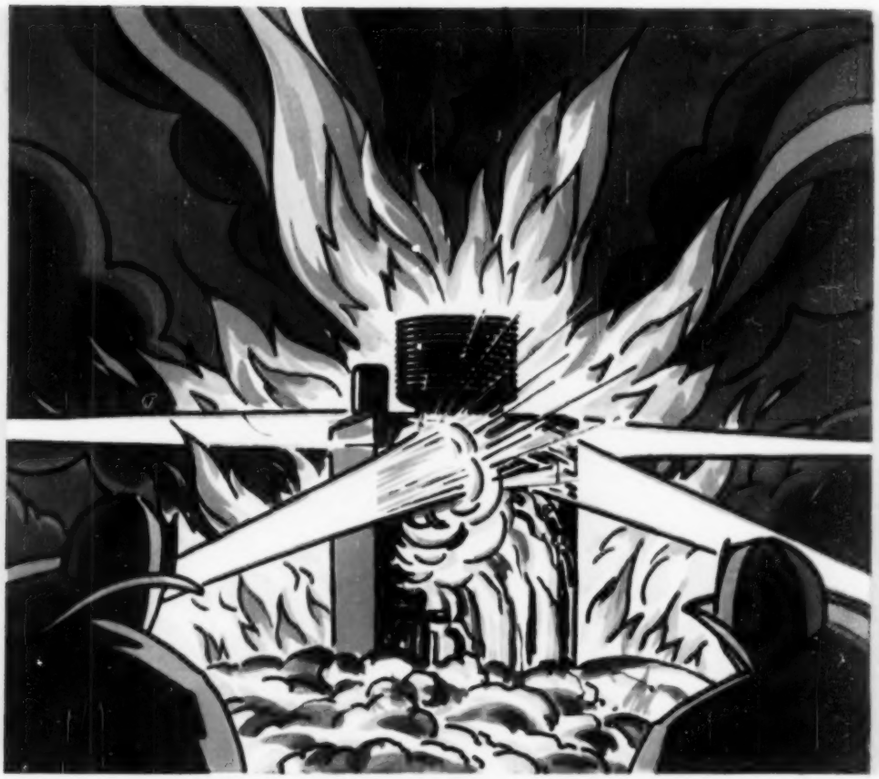
Match Boxes

[*Continued from page 69*]

lit one's cigarette or cigar to use the match as a taper and the cover as a shrine. To this the Catholic Church had no objection, but unfortunately wealthy Mexicans who either had expensive shrines or did not worship were in the habit of throwing the boxes into the gutter where they were apt to be trampled upon by horses or pedestrians. Against this desecration the Church protested, and manufacture of the cover was suspended.

Throughout the many designs, like a familiar refrain, appears again and again a *motif* of three. Why it was chosen no one seems to know, but three stars and the also familiar Vulcan design are probably the most widely used. The Llama design conceals a pun, for llama also means flame. These matches, sold in Peru, cost four cents a box (including the government tax). Dealers were in the habit of filching a few from each box and filling and selling other boxes. The company, therefore, sealed each box with a small sticker. For those who like such names, the two little figures shown looking at each other on the Dutch East Indies cover are called a "double Wajang."

There are many collectors of match box covers. As far as the International Match Corporation knows the first collector was a schoolboy from Indianapolis. He wrote to the company asking for covers and was given several hundred. A few weeks later the company had at hand a dozen letters from Indianapolis schoolboys. It was on the whole rather embarrassing. Most erudite of collectors is Professor J. D. Corrington of the zoölogical department of Syracuse University. He has been collecting for many years and has probably the best amateur collection in the U. S. To him the International Match Corporation refers all letters from collectors. It is reported that he has always refused to carry a cigarette lighter.



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powerless to check the dependable operation of THE MONITOR TOP*

Never—through all its years of faithful service in the peace and quiet of a home—will the General Electric Refrigerator be required to withstand such tests as these. But what years of service may be expected from the refrigerator that *can* survive the most terrific ravages of time and wear! In the Monitor Top, the entire mechanism is fortified against air, dirt and moisture with impregnable walls of steel. Buried in sand, frozen in ice, drowned in water, roasted in flames, the General Electric Refrigerator still ran on!

Here is a refrigerator that will wear like *steel*—because it *is* steel. A refrigerator—modern as electricity—because it *is* electric. A refrigerator built with the ingenuity, skill and sterling craftsmanship associated with the name "General Electric"—because it *is* General Electric!

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FIRE—For hours they baked and roasted it in a roaring fire. It still ran on!

FLOOD—In the icy waters of the Erie Canal they drowned it. It still ran on!

BLIZZARD—They buried it in a giant tower of ice. It still ran on!

SAND—They smothered it in an avalanche of sand. It still ran on!

**The following tests were made at Schenectady during February, 1930.*

SPLINTERS vs. SILK STOCKINGS

ANOTHER REASON FOR ALCOA ALUMINUM CHAIRS

The modern trend toward Alcoa Aluminum office chairs has been received with enthusiasm by secretaries and other women office workers. And no wonder! With no chair splinters there are no chair-torn stockings.

Furthermore, the feather-lightness of these modern chairs makes them easy to move about. The results are more energy for work, and less fatigue at the end of the day. Office managers notice too, that with Alcoa Aluminum chairs there are no more bills for repairs on chair frames. Alcoa Aluminum chairs are of one-piece welded construction. Dowels, glued joints and wood screws are eliminated altogether. You can't wear these chairs out, loosen them up, or rack them to pieces.

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CHAIRS OF
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Nitrogen: IV—*The Cosach*

The logic of ton costs

THE cartel, with its production quotas and its price-fixing, is as makeshift and as temporary as cartels must be. But the *Cosach* is a monument built for Chilean and Guggenheim posterity. It embraces the entire natural nitrate industry, enlists the Chilean Government itself as an active partner, and counts as an asset the resources of the Guggenheims—than which there scarcely exists a higher hill of wealth, prestige, and industrial experience. Rationalization, as translated into terms of technical progress, is carried in the *Cosach* enterprise, for good or ill, to its ultimate conclusion. Short of such a desperate last measure as the conversion of the *Cosach* debts into common stock—virtual repudiation—it is apparent that the organization of the Chilean nitrate industry can go no further. If the *Cosach* fails, the industry is irretrievably lost. The very scope of the plan would be the measure of its disaster.

The cornerstone of the *Cosach*, and hence the point where analysis of the plan must start, is the Guggenheim Process. As Cappelen Smith worked with Chuquicamata until copper costs *at the mine* tumbled from $300 to $100 a ton, so, for the same vigorous masters, he slashed at the $12 per ton plant cost of the old Shanks Process. He was working on far more dangerous ground, as the Guggenheims undoubtedly realized, for it is one thing to pay $30,000,000 for a new plant which will save at the rate of $200 a ton and another thing to stack that investment against a per ton saving of at most $10. Nonetheless, the dynamic Norseman was convinced that he could make his splendid structure pay; the four brothers at 120 Broadway believed him; and Maria Elena began to sprawl across the pampas.

After three years of experiment, the exact savings of the Guggenheim Process are still a little difficult to determine, but it is fair to say that they are not less than $6.00 a ton, and may be as much as $9.00. If $9.00 is the correct figure, it is possible to draw up this comparative cost schedule for nitrate of soda, delivered at New York:

SHANKS PROCESS
(per short ton costs)

At plant	$12
Bags, freight, lighterage to port, etc.	6
Ocean freight	5
	$23

GUGGENHEIM PROCESS
(per short ton costs)

At plant	$ 4
Bags, freight, lighterage to port, etc.	5
Ocean freight	5
	$14

Thus Cappelen Smith had very tangible results to show his associates. No less tangible were his bills. Before he was through with Maria Elena, the Anglo-Chilean Consolidated Nitrate Corporation had piled up a $55,000,000 debt. While various factors make it difficult to estimate the net annual charges (including amortization) on that part of the investment applying to Maria Elena, they have offset already a considerable part of the saving the process could effect. That the Guggenheims have suffered many disappointments in the development of Maria Elena is indicated by a comparison of the income projected in the prospectus issued in connection with Anglo-Chilean Consolidated Nitrate Corporation financing of October, 1925, and the results obtained by that company to date.

Yet the Guggenheim investment in Maria Elena, larger by some $20,000,000 than originally projected, is small compared with the investment to be made by the world in the *Cosach* enterprise. The capital set-up of

Cosach

Assuming annual production (*short tons*)			$2,600,000
Assuming direct cost per short ton in bags at consumers' port			14.00
Assuming selling cost per ton			2.00
Total assumed cost			$16.00
Capitalization		*Add to*	*Necessary*
Funded debt	*Charges*	*ton cost*	*price*
I. $100,000,000 new money providing for completion of plan and possible interim payments to Chilean Government in lieu of Export Tax, ranking equally with	$10,000,000	$3.85	$19.85
II. $110,000,000 assumed obligations of absorbed companies as follows:	11,000,000	4.23	24.08
Anglo-Chilean Consolidated Nitrate Corp. $54,000,000			
Lautaro Nitrate Co., Ltd. 43,000,000			
Other companies 13,000,000			
Followed by			
Preferred stock			
III. $60,000,000 7 per cent preferred stock given out to junior security holders of absorbed companies who prefer it to common	4,200,000	1.61	25.69
Total charges ahead of common	$25,200,000	$9.69	$25.69
Common stock			
IV. $300,000,000 common. Of this $180,000,000 Class A to the Chilean Government as compensation for ending the export tax and turning over 150,000,000 tons of government owned nitrate deposits. The balance, $120,000,000 (with the $60,000,000 preferred stock mentioned above) to junior security holders of absorbed companies, of which a considerable amount will doubtless go to the Guggenheims in return for Lautaro and Anglo-Chilean Nitrate stock	$30,000,000*	$11.54	$37.23

*This figure assumes a return of 10 per cent on the common which would give to the Chilean Government about $18,000,000 as against the $30,000,000 it has been collecting through the export tax.

The above figures represent a presentation of the best data available for publication on the *Cosach*. Reference should be made to the Project of Law, to the record of the Anglo-Chilean Consolidated Nitrate Corp. and to a statement by Aikman, Ltd., largest nitrate factors, wherein it is stated that only during the past few months have Guggenheim cost reductions attained expectations. Reference must also be made to the qualifying statements in the accompanying article. No official cost data is available and finance plans are not completed.

The table suggests, however, that if *Cosach* can get $37.23 for a ton of its nitrates, it will make 10 per cent on its common stock in addition to all costs, interest, and amortization. Going backwards, if it gets only $25.69 per ton, then it will make enough to pay costs, interest, and amortization but will earn nothing on the common. At $50 a ton it would, of course, make fabulous millions. This table indicates the nature of the problem, but it is based on figures which leave plenty of room for technical debate, particularly in the matter of actual to-be-realized per ton costs and in the nature and extent of the fixed charges. FORTUNE presents it as a pattern, not as a statement of economic dogma.

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Nitrogen IV—*The Cosach*

[*Continued from page 105*]

the *Cosach* has not been made public, but it is probable that investors, principally in America, may be asked to rejuvenate the centenarian industry with as much as $100,000,000 of new money. If rationalization of the industry is completed, at least two new Maria Elenas will be built. And *Cosach* must also finance, over three years, a $60,000,000 payment to the Chilean Government in lieu of the export tax. While only the future can finally justify this investment, it is now possible to analyze certain of the conditions surrounding the Chilean-Guggenheim decision to ask for it. Of these conditions, the most urgent and alarming is the world competition.

Competition

The questions of ton costs, of the price reductions which *Cosach* can profitably make, are the crux of the competitive situation. Nitrate (natural) and nitrogenous (synthetic) fertilizers are practically alike, and American farmers will not long buy Chile nitrate of soda at $38 a ton when and if they can buy the synthetic product at $30. Only within the last few years has the spectre of price competition from American producers loomed before the startled Chileans. In 1927, the U. S. produced synthetic sodium nitrate in laboratory quantities only. But in 1930, the Allied Chemical & Dye units at Hopewell are in partial production and by 1932, with the plant in full operation, Hopewell might fill half the entire (1,200,000-ton) U. S. demand. If the whole Hopewell production should compete directly (and successfully) with the natural nitrates, Chile's loss would amount to about one-third of its market. The seriousness of the threat could not be overlooked, and however violent the Chilean reorganization may seem, it comes none too soon.

Just what the *Cosach* will be able to do in the U. S. price situation is the immediate question. It cannot protect its position with the price-agreements of Europe because: (1) the anti-trust laws will not permit it; and (2) Allied is notably hostile to anything which savors of cartelization or price-fixing. As Allied is also notably committed to low cost theories, the Chileans cannot comfortably look forward to

[*Continued on page 108*]

Ewing Galloway

THE CONTRIBUTION OF THE BIRDS

Famous among all islands of the world are these, the Guano Islands of Peru. Here no man heaps contumely upon the birds that fly overhead. Were it not for them and for their quaint, unlovely habit, an important Peruvian industry would not exist. Yearly from these islands 125,000 tons of guano (bird lime) are exported, 100,000 tons to Peru, 25,000 tons to foreign ports, including the U. S. Most of the guano are shipped and sold by W. R. Grace & Co. (Grace Line, Panagra, etc., etc.). Peruvian farmers use the guano as it comes to them. So also do some U. S. farmers. About one-half of the U. S. import, however, is combined with other materials in more complex fertilizing formulas.

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A famous journalist says E. H. Harriman could build railroads, find millions for finance, deal with intricate problems . . . but *could not or would not take care of his own body.*

Men at the helm in big business! These are the men most likely to break under pressure—because they can not or will not slow down.

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Nitrogen IV—*The Cosach*

[*Continued from page 106*]

unchanged schedules. Allied has of course never made public its plans and hopes for 1932, but it would be surprising if, in that year, the American farmer will have to pay the current $38 price—or anything like it—for a ton of synthetic sodium nitrate.

It was to fix the world price, of course, that the many producers journeyed to Ostend and Paris and Berlin. If they had been able to fit *every* piece into the nitrate puzzle, they could certainly have controlled the price for as long as they could control themselves. But they did not have every piece. Allied, a very big piece, and Japan, a growing piece, were not on the table. While the current decline in steel production will make an important cut in the supply of by-product ammonia, this is more than offset by the new, uncontrolled synthetic production coming from America and Japan. Here is the threat to the cartel from without. And while the Europeans will accept rigid quotas as an emergency measure, it is doubtful how long they will be willing to stand the terrific costs of half-idle plants. This is the threat from within.

Through the cartel, however, both Chile and the European producers are given a fairly comfortable period of reflection. The I. G., which towers above the rest, is yet not strong enough or courageous enough to play its hand alone. Like almost every other European company (Courtauld's is a shining exception) it prefers to trust its profits to diplomacy. The advantages of this course are perhaps more apparent than real: its dangers are well known to practically all of the 1,200 cartels which have thrown their network over German industry.

Salvage

Thus the competitive situation. Unquestionably it could not have been met by the old industry. Even at $40 a ton, most nitrate companies lost money producing under the Shanks Process after the export tax, and price reduction was out of the question. Chile was on the verge of losing an industry, and one of the only two industries it possesses. Whether or no the *Cosach* is wise, there can be no argument over the fact that it was necessary. That the government clearly realized the gravity of the situation is evidenced by the heroic step it took in the direction of salvage. By abolishing the export tax, it clipped $12 at one stroke from the producers' costs. (The government, by sharing in *Cosach* profits, undoubtedly expects to recoup this loss.) To this could be added the possible $9.00 saving in process. When ton costs had been halved, there was room for experiment. The industry was at least alive. In a sense, therefore, it becomes of purely academic interest to debate whether or not the *Cosach* plan should be put into effect. The fact is that it *must* be put into effect if the new industry is to survive at all.

The $100,000,000 will complete the process whereby ton costs, before interest, will be reduced from $35.50 to $14. Interest and amortization on the new money, added back to costs on a production of 2,600,000 tons, brings the new cost to $18, a net gain of $17.50. And each dollar over $18 which the new industry can get translates itself into $2,600,000 of income it would not otherwise possess. This is the real argument for rationalization, and obviously justifies the *Cosach* to Chile and the producers.

Profits

This is not to say that the *Cosach*, *as a corporation*, will necessarily show profits, or even meet all its charges. With the price of sodium nitrate at $30, there remains a new $12 per ton income. Subtract $2.00 for selling costs, and the annual benefit totals some $26,000,000. This has some way to go before every element in the *Cosach* is happy. On page 105 is printed a box which suggests the amount of satisfaction the various *Cosach* factors may expect.

Certainly this experiment faces tremendous difficulties. The nitrate industry is in a period when neither production nor price can show the stability which alone effects real rationalization. Yet the effort of the *Cosach* must remain one of the most challenging ever attempted by a major industry.

THE RAILROAD PRESIDENT MAKES FRIENDS WITH HIS PUBLIC

• THE HEADS of transportation companies, like certain kings and caliphs of history, might do well to travel in their own smoking-cars, trolleys or busses, *incognito.* They would be quite likely to hear their companies abused, callous remarks passed about their policies, and jests made at the expense of their rolling stock. For there is perhaps no business more subject to misunderstanding on the part of its clientele than that of the public carrier. • In a five-minute conversation with any one of its passengers, the railroad President could make a staunch friend for the company. But how is he to secure such individual contact with the hundreds of thousands of users of his lines? • He can *write* to them. He can take each commuter, each shipper of freight, each stockholder, into his confidence, and tell him, straight from the shoulder, about the aims and achievements of the road. Such a message, typewritten on the letterhead of the President's Office, and signed with the President's name, will be read and remembered with respect. • In transportation, as in so many other fields, Coupon Bond is the paper chosen by business leaders for their executive correspondence. Coupon Bond is made 100% of new white rags—a supreme achievement in paper making. Its strength and dignity are expressive of the highest traditions of business. And its watermark is known from coast to coast. • Our portfolio, "The Modern Trend in Letterheads," and a new booklet, "The Executive Letter," will be sent you on request. (In writing for them please use your business stationery.) ¶ *Coupon Bond is but one paper in the Eagle-A Line of Bonds, Ledgers, Writings, Index Bristols, Offsets, Covers, Book Papers, Mimeograph and Manifold Papers—the* right *paper for every business purpose.*

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The World's Biggest Drug Chain

[*Continued from page 44*]

been, the project would have failed miserably if Drug, Inc. could not have summoned the man-power to effect its plans. In every argument pro or con the chains, the question of management plays a vociferous part. Therefore let us arrest the management of this world's largest drug business in the full swing of a busy morning and make each of Drug, Inc.'s major executives show us exactly what he is doing. As questions of rank are never posed in the Drug, Inc. offices (there having been no need to pose them), we may begin quite at random in the offices of Mr. George M. Gales, the unquestioned Drug, Inc. expert on retailing. On this particular morning, Mr. Gales is noting that August sales of the Boots stores are up from August of last year, and while Mr. Gales is agreeably impressed by the sheets before him, he is scarcely surprised. In fact, it is very difficult to surprise Mr. Gales, and when he *is* surprised there is apt to be trouble. For this spruce, cultivated, Southerner-turned-Long-Islander makes it his business to know just what profits each store should show and then makes it the store's business to show them. He has a notable record with United Drug; the job which pleased him most was going to England in 1920 and putting Boots on its feet.

Mr. A. H. Diebold and Mr. W. E. Weiss should be summoned together, although on this particular morning Mr. Diebold is in New York's Liggett Building and Mr. Weiss is at the great Sterling factory in Wheeling, West Virginia. Messrs. Diebold and Weiss comprise the Sterling team. Out of Canton, Ohio, some twenty-five years ago, came a tall, mild man and a short, aggressive man. The tall, mild man had the ideas; the short, aggressive man put them into practice. They are today the dominant figures in Sterling, and their methods are the same. It was Mr. Diebold who conceived the tremendous Sterling expansion of the last two years; Mr. Weiss made it possible and profitable.

After these, we might interrupt Mr. Charles McCallum, to discover him thumbing through a sheaf of newspaper clippings. Each day, from every town where there is a Liggett store, come the advertised price-cuts of Walgreen or Katz—competitors. "Cigarettes—94 cents a carton" "Aspirin—35 cents for 3 tins" "Ipana Toothpaste—37 cents" The lists are long, and the day's sheaf is high. Mr. McCallum will tell you that the independents are often worse than the chains. "You cannot sell below cost price and remain in business," he observes. "Our price policy is simple: the lowest possible price to the consumer consistent with good business." Sometimes Liggett will meet a competitor's campaign; more often, not. But prices are daily problems for other reasons. There are the Liggett stores' birthday sales, when you can get a fifteen-cent soda for a nickel. And a store in the South may be overstocked with candy as a hot spell approaches. United Drug studies the weather, as it studies the flu and other odd subjects. But in general its price policy is both stable and constant.

Even simpler is Drug, Inc.'s price program in England, where operate the Boots stores (founded by Jesse Boot, now Lord Trent. He chose his title from the river

A. H. DIEBOLD

Underwood & Underwood
W. E. WEISS

MAKING BY-PRODUCTS PAY DIVIDENDS

Six billion pounds of steam a year are supplied to the Standard Oil Company of Louisiana by the steam power plant of Louisiana Steam Products, Inc. Electric power is supplied by the same plant to the Baton Rouge Electric Company. Both companies are served at lower cost. This saving is accomplished by burning all available residuals of the Standard Oil Company's refinery.

The plant, designed and built by Stone & Webster Engineering Corporation, was operating in 5 months and 12 days from the time ground was broken.

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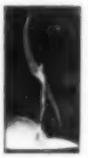

Waste products . .

a penalty in business today . . now go under the eye of the research laboratory and emerge in new form, useful, economical, and rich in sales opportunity. The Rand Laboratories, Incorporated, is a group associated for service to industry, in the field of chemical, electrical and mechanical research.

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which runs past his estate). There a merchants' protective trade association, government organized and supervized, places a stamp (like the U. S. Internal Revenue sticker on packages of cigarettes) on all drug goods. The stamp proclaims a price, and all druggists are forbidden by law to undersell it.

Likewise in the Liggett Building in New York is W. C. Walt, treasurer and financial brain of Drug, Inc.—and, irrelevantly, perhaps the best golfer in the company. And, of course, there is Mr. Liggett in Boston. He is somewhat less active now than when Leon Street was young, but his command of figures and his extraordinary memory are still Drug, Inc. assets. He is a large, ruddy person, cheerful and convivial. As Republican National Committeeman of Massachusetts, he was stormy and vigorous and caused much comment among dry Republicans by a devout espousal of the anti-prohibition cause. He has a home in Newton, Massachusetts. He yachts on his *Ambler* and keeps hunters. But he likes his business and he likes his office, which is filled with photographs of friends and family and many an old copy of his firm's house magazine, *Rexall Advantages*. On the wall behind his chair hangs a painting of the original Leon Street building. On the dictaphone on his desk is a little brass pig.

His first business experience, at the age of fourteen, was selling for Wanamaker's. His first (and unsuccessful) venture into the drug business was selling a headache tablet. He has a flair for organization and is able to inspire both confidence and enthusiasm in his associates. In 1921 the stock of Drug, Inc. was badly depressed, and Mr. Liggett found himself unable to liquidate his holdings in order to meet certain obligations. Rexall agents loaned a total of $1,250,000 and enabled Mr. Liggett to get out of his difficulties. He is undoubtedly as well informed about the drug business as any man in the U. S.

Drug Inc.: *Sterling Products*

[*Continued from page 45*]

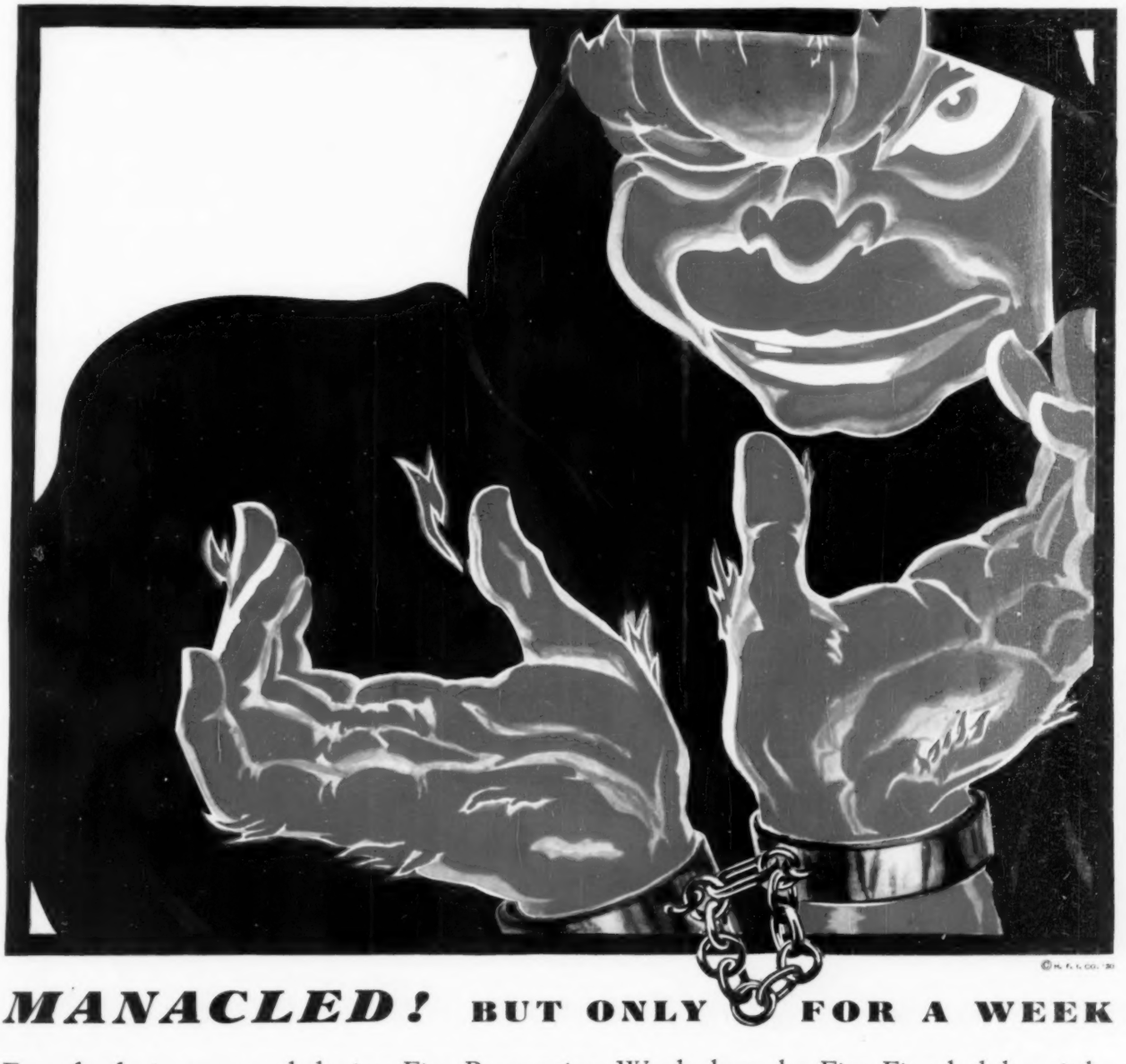
produced and Winthrop-marketed, is thefamous 606, better known as salvarsan, which makes war on the trypanosomes responsible for African sleeping sickness and annihilates syphilis germs. It was discovered by Paul Ehrlich, than whom no more picturesque figure ever appeared among research workers. He was born in 1854 in Silesia. At school in Breslau he was brilliant but intellectually unruly. Asked to write an essay on the subject, "Life is a Dream," he composed these sentences: "Life rests on normal oxidations. Dreams are an activity of the brain and activities of the brain are only oxidations."

His god was Robert Koch, and it was Ehrlich who showed Koch how to stain tissue and see the tubercle microbe. Dabbling with the germ, he caught tuberculosis and went to Egypt, returning in 1890 cured by Robert Koch.

He was constantly experimenting with dyes. One day as he watched methylene blue course through the tissues of a rabbit, he noticed that dye stained only the nerve endings. He decided to discover an aniline dye which would select a microbe for annihilation, avoiding the tissue and leaving it unimpaired. For several years he experimented with trypanosomes. Then he read of a poisonous drug called atoxyl, of which arsenic was the strategic substance, which had proved efficacious in a few cases of sleeping sickness. Ehrlich blithely said, "We will change it a little." Every scientist assured him that atoxyl could not be changed, but Ehrlich continued his work. The rest of the story is well known. After 605 failures, Ehrlich's 606th experiment produced salvarsan, which killed trypanosomes and left no trace or after effects. It was the result of twenty years of "mad unscientific work." It was the most important chemico-medical discovery of a century.

GEORGE M. GALES

FIRE PREVENTION WEEK



MANACLED! BUT ONLY FOR A WEEK

Everybody is on guard during Fire Prevention Week, but the Fire Fiend slyly winks and says to himself: "Watch me get busy during the rest of the year." : : He may have his eye on *your property.* It is up to you to guard against him all year round.

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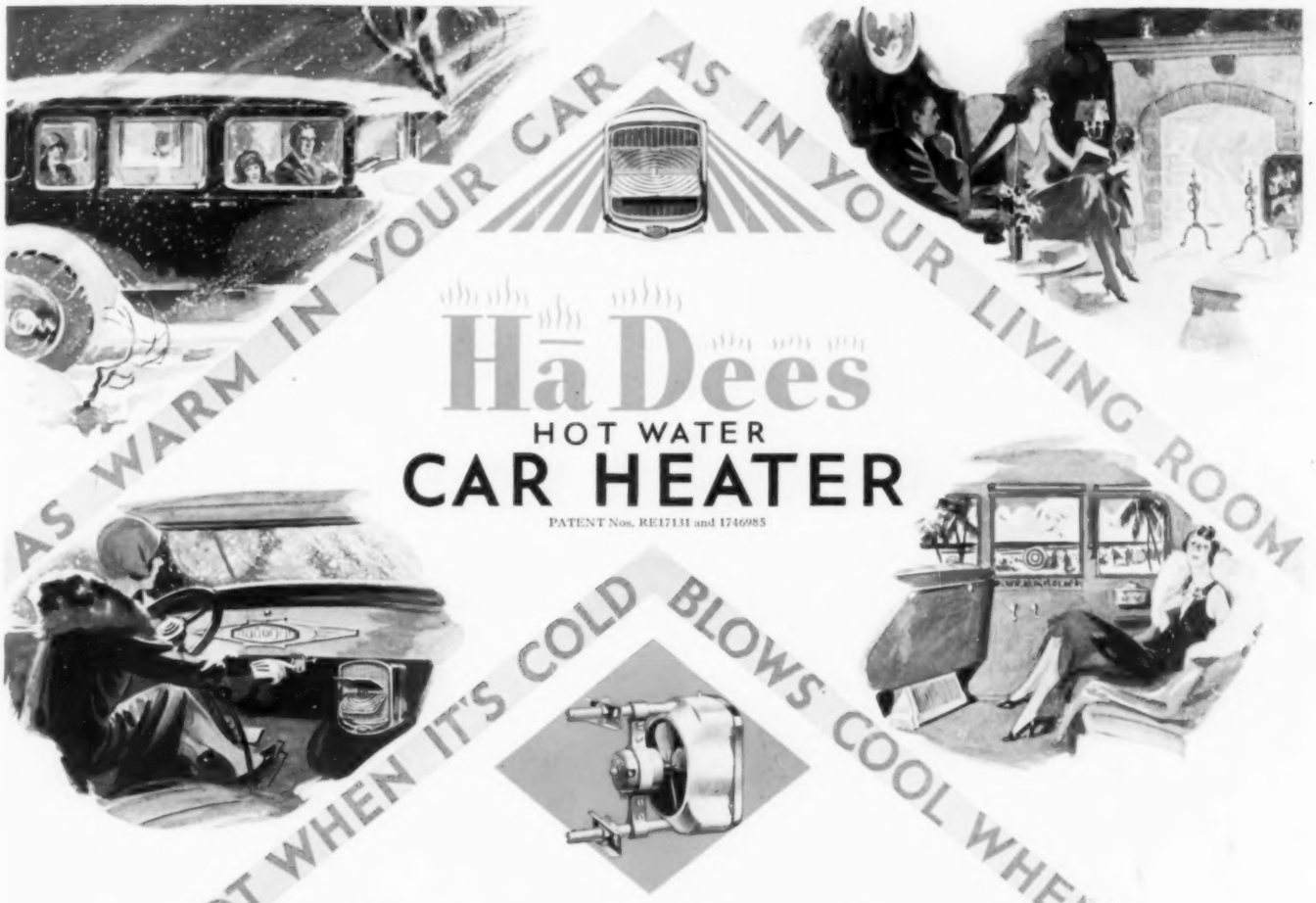

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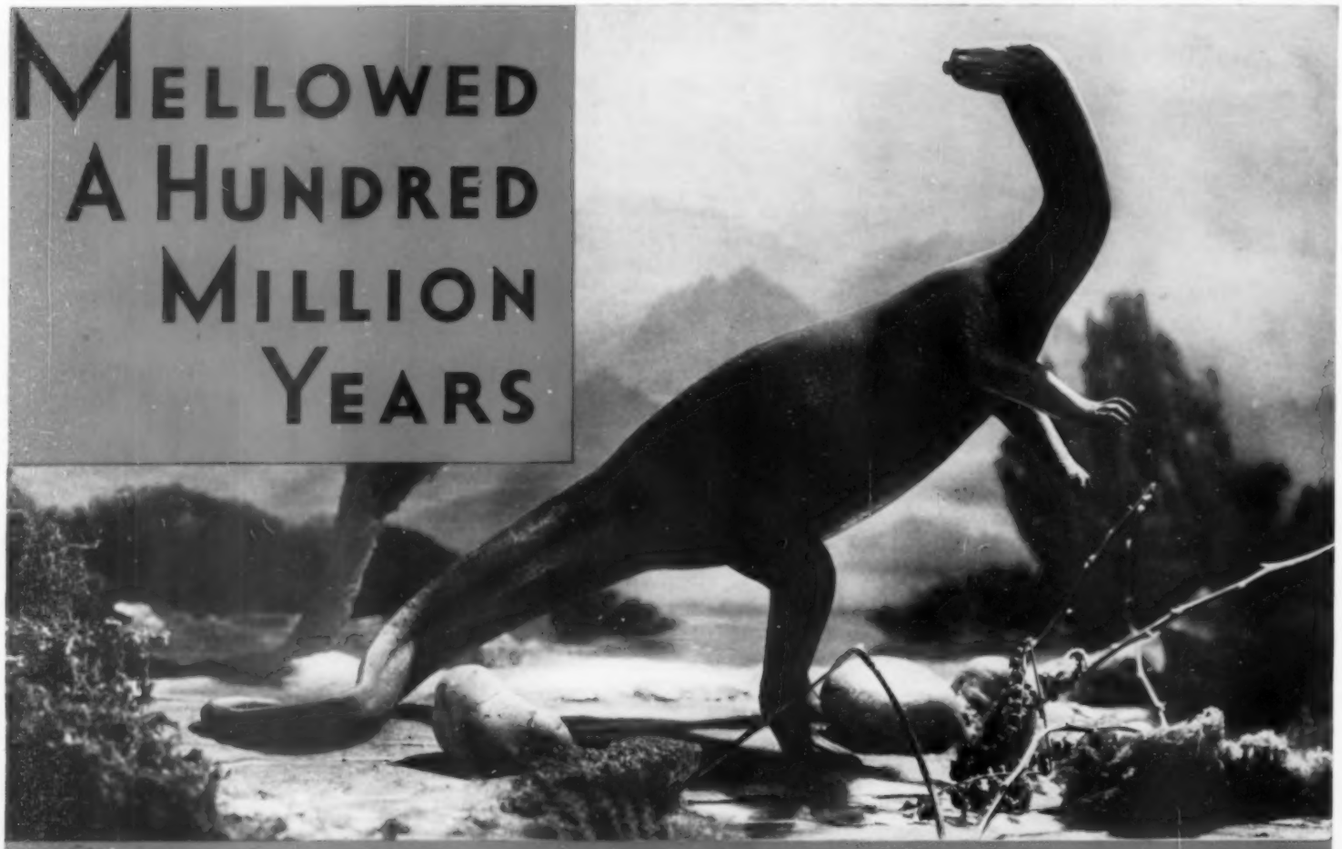

Long, long ago in PENNSYLVANIA

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Adamses Alive

[*Continued from page 64*]

Out of his reveries and researches came *Mont Saint Michel and Chartres*, *The Education of Henry Adams*, and innumerable historical works. In Washington he and his wife (Marion Hooper of Boston), the John Hays, Clarence King, and a few others formed a circle which was unquestionably the social apex and one of the intellectual centers of American life. It is impossible to conceive of Henry Adams making money, although his marriage brought him emoluments of this sort. It is still more impossible to imagine the diffident Brooks entering the financial lists. A pensive eccentric, he married a sister of the late Mrs. Henry Cabot Lodge and taught a while at Boston University Law School. But mostly he evolved theories to account for what he considered the decay of civilization, and wrote fastidious and woebegone treatises such as *The Degradation of the Democratic Dogma*. Presumably he lived on his inheritance; economically, at least, he never seemed to be other than comfortable. Henry Adams in his *Education* admirably suggests the sensitive state of mind in which he and Brooks presumably found themselves, one which would have surely kept them away from the commercial excitement of the times. Said he: "The habit of doubt; of distrusting his own judgment and of totally rejecting the judgment of the world; the tendency to regard every question as open; the hesitation to act except as a choice of evils; the shirking of responsibility; the love of line, form, quality; the horror of ennui; the passion for companionship and the antipathy to society—all these are well known qualities of New England character."

But the most significant example of the Adamsian reaction to the changing world is found in the history of the Minister's second son, Charles Francis Adams II. Here was an Adams who braved the thunders and stresses of the materialistic sphere. Characteristically, however, he began as a theorist. An aimless lawyer with courageous service in the Civil War just behind him, he inspected the American scene in order to discover a field with a future. He fixed on railroads. Quite ignorant of them, as logically unjustified as a housewife who should try to write an essay on chain stores, he conceived an article on railroading for the *North American Review*. But Adams's intuitions were cogent; he learned and wrote more and more, finally became a member of the Massachusetts State Railroad Commission (his wise suggestions solved the Boston & Maine strike of 1877), and impaled the nefarious Gould with a journalistic barb on the Erie scandals. During these years he was also president of the Kansas City Stock Yards Company, a post which he held for forty years, building it up from a small concern earning some $20,000 annually to the largest organization of its kind in the world, capitalized at $10,000,000 and earning $1,200,000 per year.

This does not sound like an Adams. But wait. The man's prestige as a railroader practically forced him into the presidency of the teetering Union Pacific (1884). He saved the road from bankruptcy. Again, this is scarcely Adamsian. After five years in the chair, however, he began to feel that his influence was no longer beneficent; things were not going well. Of this unhappy period he was to write in his *Autobiography*, with truly Adamsian candor and self-scrutiny: "I was . . . wholly demoralized. I hated my position and its duties, and yearned to be free of it and of them. My office had become a prison-house. Loathing it, I was anxious, involved, hopeless. I had accordingly become a plunger; rapidly getting beyond my depth . . . I displayed indecision and weakness . . . I simply rode for a fall; nor did I really care when or how I got it." This is not the utterance of a man bent on personal combat and achievement in the field of industry; it suggests, rather, the cries of distress which his grandfather, John Quincy Adams, made when badgered by fellow members of the House of Representatives—the cries of a thwarted public servant. There is no evidence of financial ambition egging him on; he seems to feel that he is no longer of use to the railroad and he is miserable. The happy relief came when the

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Especially do conditions today demand real leadership—knowledge, vision, fighting determination and courage. Dependable information must be more constructively used. Inefficiencies must be eliminated, more competent organization built up, new ideas and better methods adopted—to prevent loss and insure profits and good-will.

Leadership is blind without knowledge. Knowledge of one's business comes from the analysis of facts incident to sound planning, and from the frequent comparison of operating results with a well-made budget. Such analyses and comparisons point out weakness and waste, suggest better methods, indicate new sources of profit. They are chart and compass to renewed progress and greater success.

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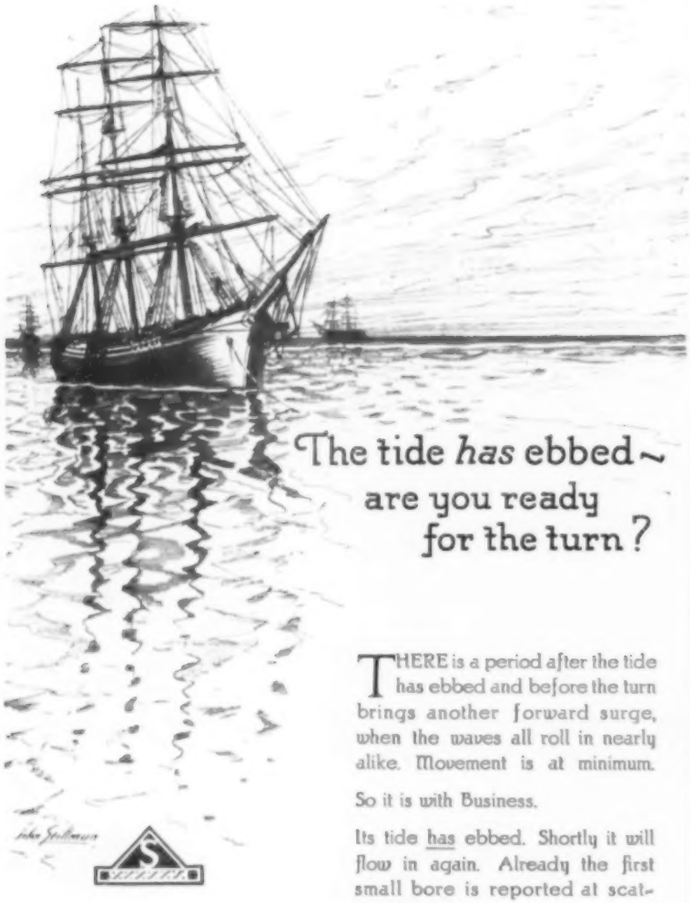

The tide *has* ebbed ~
are you ready
for the turn?

THERE is a period after the tide has ebbed and before the turn brings another forward surge, when the waves all roll in nearly alike. Movement is at minimum.

So it is with Business.

Its tide has ebbed. Shortly it will flow in again. Already the first small bore is reported at scattered points.

Now, before business gathers momentum towards its flood, is the time to prepare to sail in with the tide.

Call in the Engineer now to sound your productive channels and remove the bars that there may be no waiting when demand will again be normal. Plant and machinery studies and reorganizations should not be delayed. Plans should be made for possible needed additions.

The tide has ebbed.

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Surveys	Steam Plants	Hydro-Electric Systems
Examinations	Water Supplies	Power Application & Lighting
Appraisals	Reorganizations	Sanitary Engineering

revengeful Gould ousted him after a six year tenure of office. If one needs further indication that the Union Pacific was far from owning this man, there is the fact that during his presidential years he constantly issued historical papers and in the last year published his two volume biography of Richard Henry Dana. On the strength of these writings he was elected to the presidency of the American Historical Association, an honor which either of his historian brothers would have been delighted to receive.

Charles Francis Adams II acquitted himself most creditably in what, to his family, was thus far a foreign field. He made a great deal of money, which fact is not impaired by the fact that he lost most of it in the panic of 1893. In other words, he demonstrated that an Adams might assume with credit the industrial stage. But he seems far happier in his more detached rôles, as his parting salute to the money marts would indicate: "I have known, and known tolerably well, a good many 'successful' men—'big' financially—men famous during the last half century: and a less interesting crowd I do not care to encounter. Not one that I have ever known would I care to meet again, either in this world or the next: nor is one of them associated in my mind with the idea of humor, thought, or refinement. A set of mere money-getters and traders, they were essentially unattractive and uninteresting. The fact is that money-getting, like everything else, calls for a special aptitude and great concentration; and for it, I did not have the first in any marked degree, while to it I never gave the last."

. . .

Thus the Adams family through the fourth generation. The solemn honest faith in God of the Adams statesmen evolves into the doubts and questionings of the Adams scholars. But throughout the Adamses have been men who have taken life seriously and tried to arrive at its ultimate rather than convenient significances. It is too early to make any such generalizations about the fifth and subsequent generations. Their most noteworthy members are spread on these pages. Whether or not they have made a more successful adjustment than their ancestors to the tempo and spirit of the times, the reader must judge for himself. He must also judge whether he would have them do so.

Atom S

[Continued from page 83]

the surface by air pressure, collected in barrels, cooled. But Frasch's friends argued that it would be impossible to pump superheated water from a boiler to a well and then plunge it 700 feet into the cold earth at a superheated temperature.

Frasch admitted that the first few hundred gallons of water would be cooled off, but when Frasch spoke of water he was speaking in terms of lakes, not pipes: he intended to heat the very bowels of the earth. Into the Calcasieu Parish deposit he sank three concentric pipes: the outer pipe, six inches in diameter, was for water; the middle one for melted sulphur; the inner one, only an inch across, for compressed air. Having rigged up a dozen barrels to receive his hypothetical sulphur, he turned on his pumps and waited. He waited a long time. There had been such comedy made of the idea that he wanted to make sure of melting his sulphur. At last he opened the release valve, was greeted by a spurt of brownish liquid with an awful smell shooting up from the mine. The barrels were simply useless. Frantic men dug trenches to collect pools of melted Atom S, and the most efficient of all mining processes in the world was achieved.

Although the Frasch patents were originally owned by Union Sulphur Co., they have now expired, the Louisiana deposits are extinct, and both Texas Gulf and Freeport Texas use Frasch methods. Millions of gallons of water at 330 degrees Fahrenheit are pumped into the earth by these companies every day—up to fifty tons of water out of vast blue reservoirs for every ton of brown liquid sulphur that is raised to the surface. Still liquid, the sulphur is run through steam-gutted pipes to distributing tanks, whence it is pumped to temporary bins 600 to 1,000 feet long, forty feet high. Here it is accumulated very slowly, each

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accumulation being given a chance to solidify, and is finally blasted for shipment. No water comes out of the mine with the sulphur because Atom S is heavier than Molecule H_2O, sinks to the bottom. But water is constantly drained away by bleeder wells from which it emerges at about 180 degrees Fahrenheit and is sent back to the boiler plant where it is used to pre-heat fresh water entering the boilers.

Such is the method that enables Texas Gulf and Freeport Texas to out-produce and undersell the world. The method cannot be used in Italy because the geological formations are not adapted to it. Italian sulphur deposits are mines, those of Texas are really wells; nor is the geological setting so favorable anywhere else in the world, being the envy of miners and industrial chemists everywhere. Even thus has Nature, with her usual indulgence toward Atom S, set him up as a 20th century hero—the glass of fashion for the chemical industry and its mould of form.

TEXAS GULF SULPHUR CO.

Production 1929: 1,403,640 long tons
Net profit (before depletion): $16,247,478
Earned per share (before depletion): $6.40; dividend $4.00

Texas Gulf is the low-cost sulphur producer of the world. It was organized in 1909 as the Gulf Sulphur Co. by Bernard M. Baruch of New York and Colonel S. W. Mudd of Los Angeles. In 1919 the house of J. P. Morgan bought stock, together with Colonel William Boyce Thompson, who is no longer a large holder. Enter also in 1919. . .

President.—Walter H. Aldridge, distinguished mining engineer of the West, chief mining metallurgist of the Canadian Pacific, 1897 to 1911, and managing director of the Consolidated Mining & Smelting Company, which developed the giant lead smelting and electrolytic lead refinery at Trail, B. C. He has been president of Magma Copper Co., managing director of Inspiration Copper Co.

Officers.—Vice President Charles F. Ayer of New Rochelle, president of Newmont Mining Corp.; Vice President Wilber Judson; Secretary-Treasurer Henry F. J. Knobloch.

Directors.—George Whitney, able partner of J. P. Morgan and Co. since 1920, director of Guaranty Trust Co. of New York, The Pullman Co., General Motors Corp., and a dozen of the nation's leading industries; Thomas S. Lamont, one of the youngest of the Morgan partners; Herman B. Baruch, tall and stately member of the board of managers of the New York Cotton Exchange; Clarence M. Woolley of the American Radiator Co.; Harvey S. Mudd, Los Angeles, California; Walter H. Aldridge; Charles F. Ayer; Wilber Judson; Henry F. J. Knobloch.

FREEPORT TEXAS COMPANY

Production 1929: 916,260 long tons
Net profit (before depletion): $4,085,042
Earned per share (before depletion): $5.60; dividend $4.00

President.—Eugene L. Norton, by way of contrast to Mining Engineer Aldridge of Texas Gulf, is a Baltimore financier. In 1921 he organized and became president of the Atlantic Trust Co. of Baltimore, combined this with the National Exchange Bank of Baltimore, combined this with the Baltimore Trust Co., largest Baltimore bank in Baltimore's most magnificent office building. A close friend of Langbourne M. Williams of John L. Williams & Sons, Richmond, Virginia, who were members of the original Freeport Texas syndicate, President Norton was not unfamiliar with the affairs of the company when he took charge of them in the reorganization of April, 1930, largely brought about by . . .

Vice president-treasurer.—Langbourne M. Williams Jr., wiry, energetic graduate of the University of Virginia and the Harvard Business School. Because his father's firm was receiving so many unanswerable inquiries about Freeport stock he set out with his Virginia drawl to investigate. He was backed and encouraged by . . .

Chairman of the board.—O. R. Seagraves, self-made Texan of Moody-Seagraves Co., organizer of the United Gas Corp.'s super-gas system. Mr. Seagraves is also connected with Electric Bond & Share interests.

Directors.—George Gordon Battle, Edward N. Chilson, Elmer G. Diefenbach, Herbert B. Flowers, Charles B. Holladay, Ralph C. Holmes, P. George Maercky, William L. Moody III, Lindley C. Morton, Victor G. Paradise, Lewis E. Pierson, Edward H. Thaete, John Hay Whitney, Frank A. Wills, Eugene L. Norton, O. R. Seagraves, Langbourne M. Williams Jr.

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Man and Woman and the Public

[*Continued from page 41*]

Romance, tempestuously histrionic . . .
JOHN BARRYMORE

As the "Screen's Greatest Lover," his classic profile turned monotonously to the camera, he was beginning to pall as a silent picture attraction when the talkies liberated the resonant Barrymore voice, tripling his value. *General Crack*, the highly expert and successful costume romance that was his first talkie, was followed by the slapstick hilarity of *The Man from Blankley's*, a picture in which Barrymore, as a society inebriate, hiccuped and reeled with obvious gusto, even permitted himself to be gastronomically deceived, in full evening dress, by a roast rubber duck. His exuberant holiday from chronic film amorousness reached another climax when, as peg-legged Ahab in *Moby Dick*, he hacked to pieces a screen whale resembling a large mattress. In the silent era, he would not have been permitted such changes of appeal; now his versatility is an added attraction.

Manhood, charged with undefiled primitive strength . . .
GEORGE BANCROFT

His vogue has been hurt because he has had to play in bad pictures. The formula generally used for him (a strong man fighting alone against enemies who plotted to overthrow him by subterfuge) ran so thin that its unrealities were, in *Mighty* and *Ladies Love Brutes*, more than he could handle. Because of the difficulty of finding the right sort of story for him, it is likely that his importance is on the wane.

The old school of dramatic acting, brilliant and colorful . . .
GEORGE ARLISS

Symposiums of critics everywhere voted his *Disraeli* the best picture of 1929. In Galsworthy's *Old English*, he will undoubtedly rate well up in the best ten for 1930. But although Warner has made immense capital of him by the simple process of taking photographs of his great stage hits, he will soon have run through his repertoire. Since George Arliss is sixty-two years old and since it is unlikely that studio hacks can arrange any stories as satisfactory as those the leading playwrights of twenty years wrote to order for him, his future in sound pictures is problematical.

The handsome young hero of cinema tradition . . .
RICHARD BARTHELMESS

His ability as an actor, often questioned, became definite as soon as he could talk. He was cast in pictures, notably *Drag*. He stands high among veteran stars whose value has been increased by the sound device.

Sentiment, in its masculine aspects for first-love fables . . .
CHARLES FARRELL

Continuing to draw as Janet Gaynor's team-mate, he proved that he could talk all right and even sing a little.

Humor, combined with sex appeal . . .
RICHARD DIX

He was not consciously humorous in one of Paramount's first color pictures, *Redskin*, but the company found more uses for his talent in lighter stuff. His first silent picture success had been in straight romantic roles. Now he plays popular comedies engagingly for the microphone. This ability, combined with his exploited physique, induced RKO to buy him from Paramount at a price which, though high, they have not regretted.

Uproarious modern clowning with a character angle . . .
JACK OAKIE

His is the only first-rank comic talent developed by the talkies. The development took place in a few months on the Paramount lot where he rose from insignificant parts to having his name in lights. Like all true comedians, he makes even his wildest fooling human and remotely pathetic. It is current, home-bred, democratic fooling (*The Social Lion*, *The Sap from Syracuse*), probably not exportable but wildly contagious in the U. S. Oakie is on the way up while the great foolers of the silent era like Lloyd and Chaplin are on the way out. He is the precursor of the great arch-clown of the future talkies who will some day convulse the world.

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Color and Sound on Film

[*Continued from page 35*]

1929-30 pictures were made in color), and as for black and white pictures being obsolete in contrast with color pictures—that simply did not occur to the movie public. So for 1930-31 the trend seems definitely in the direction of less, rather than more, color. First National and Warner Brothers are postponing the fulfillment of their contracts with Technicolor—a procedure which was in any case necessary, since Technicolor simply could not print the pictures as fast as Hollywood thought it wanted them a year ago. So far has the color wave declined after its tidal sweep last winter that some movie executives have pronounced it of small importance. But in this they are likely to be quite wrong again. To be specific, there are two kinds of film plays for which color will almost certainly become essential: the musical comedy and the costume or spectacle drama. Both these types will rise and fall in popularity, but they will always be a big factor in the business. The talkies definitely added the musical comedy to the movie repertoire. From now on it seems likely that this type will increasingly become associated in the public mind with color, so that a film musical without color will not seem like a film musical at all. A similar mental association will not occur so definitely in the spectacle drama, but anyone who saw *Song of the Flame* or *The Rogue Song* will realize that if a producer is offering the spectacular he can hardly afford to omit the spectacular qualities of red and gold and purple. A public accustomed to red torches flaming in the night will not accept a parade of ghostly candles without the ghosts.

However, all of this sort of stuff is *not* the backbone, the meat and drink, of the movies. The big elaborate or sensational pictures are essential to the movie business, but they do *not* account for the bulk of the box office receipts. People go to the movies primarily to watch and to hear two or three human beings collide with each other in what is represented to be life. With the silent, and now more than ever with the talkie, the play is the thing. So, after allowing that 20 per cent or even 30 per cent of the movies must be in color for the special reasons just indicated, the great question is: is the time near when the ordinary play of love or adventure must be made in color?

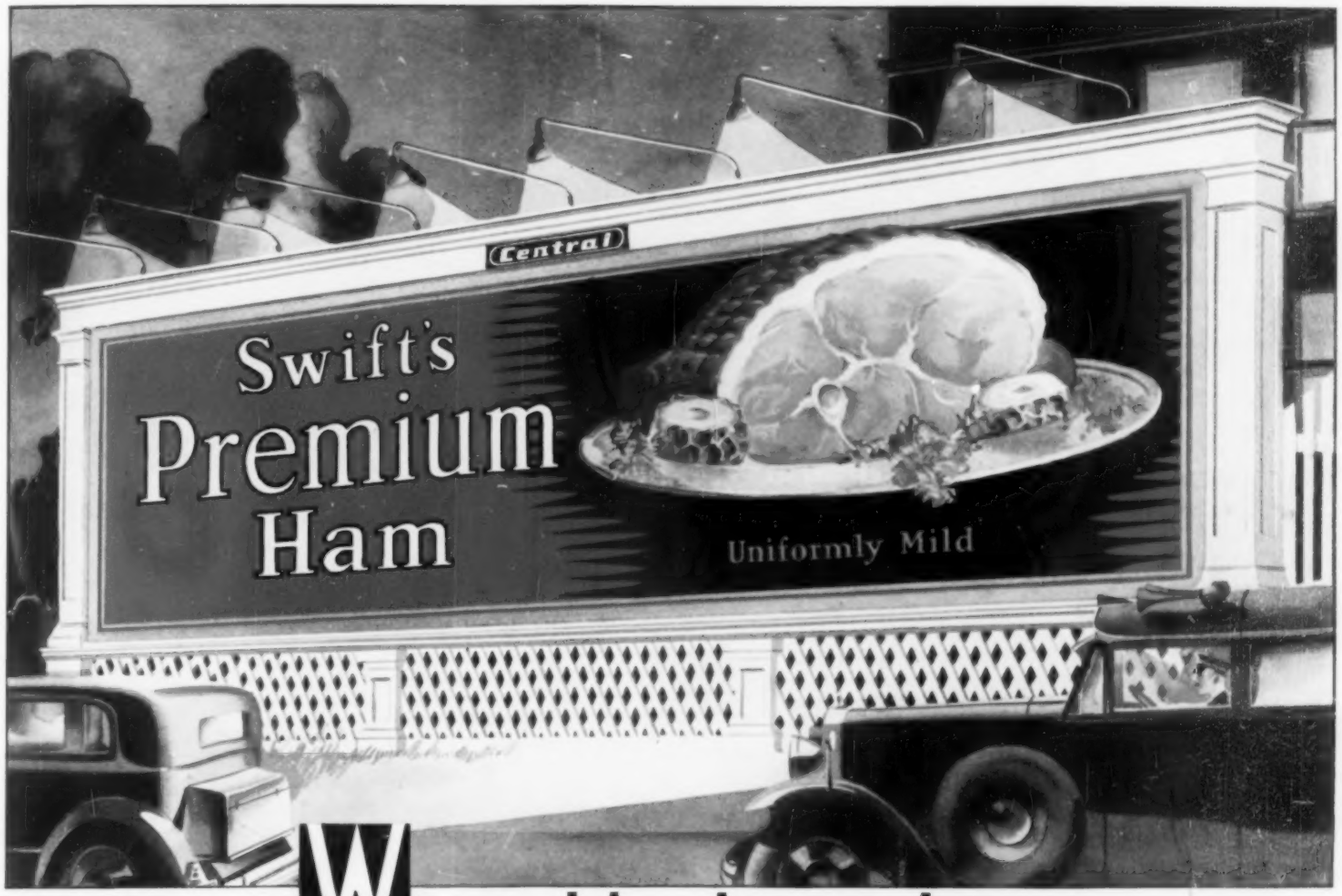
Certainly the time has not yet arrived; it is probably several years and perhaps a decade away. Simply put, the reason comes down to this: to the degree that we are aware of the imperfection of color it is a distraction and consequently hinders rather than promotes dramatic action. To cease to be a distraction, color must be so perfect as to be *unnoticeable* except by contrast with absence of color. Or, what is more likely, we must become so accustomed to the imperfections of color as not to be distracted by it. Such perfection or such psychological adaptation is in all probability many, many years away. As for perfection, it is almost certain that an entirely different scientific principle must be employed before it can be expected. As for psychological adaptation, the more imperfect color we see, the less it will distract us until finally we will accept it as a convention and will be distracted when it is absent. Ultimately *all* movies are likely to be in color; until then every producer will be on his guard against failure to keep up with the color convention.

Meanwhile, technical improvement, however slow, may be expected. And almost as important as technical advance will be advance in the film theatre use of color. Two examples: use color to lengthen the life of favorite stars, for color hides the wrinkles: use it more soberly and hence less distractingly—green lawns, green trees instead of a continued riot of roses.

Historic date

Undoubtedly producers jumped too fast at color this year. But to understand why they have good reason to jump at *any* new offering of invention, it is necessary only to grasp a few dates in the history of sound. These are dates in what we have already described as by all odds the most remarkable single revolution in industrial annals. Sound came so fast (it became "natural"

[*Continued on page 127*]



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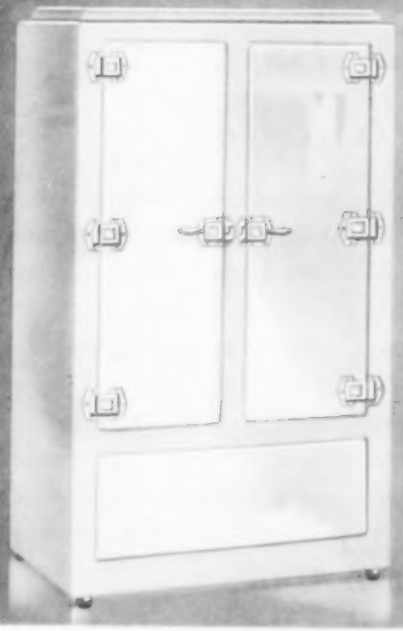

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Color and Sound on Film

[*Continued from page 124*]

so soon) that practically nobody (and least of all the movie critics) realized what was happening until it happened. Even the producers were in the condition of learning on Tuesday that what they thought might occur a year from Tuesday had actually happened a week ago Monday. In April, 1929, Fox's Mr. Sheehan, simultaneously with his company's complete surrender to the talkie, boldly predicted that by January 1, 1931, there would be 3,000 theatres wired for sound. There are today 10,000 such theatres. Let us fix a few essential dates in mind because, for once, a mechanico-economic development happened with the historical exactitude of a Napoleonic campaign. The first date is October 6, 1927.

On that night the Warner Brothers' theatre on Broadway and Fifty-second Street (the only one they owned—now they own 700) was flashing in electric signs: *Opening Tonight—Al Jolson in The Jazz Singer.* A fashionable crowd streamed through its portals, for Al Jolson was the embodiment of Broadway; now as a film product of Hollywood he was as great a novelty as would be King George V in the guise of President of Canada. He had been in Hollywood for months: tonight would appear the strange result of his new labors. They had been labors indeed—singing bit by bit to a microphone while being photographed bit by bit, and trying to act a part the while. Not only was it new to him; it was new to everyone of the dozens of cameramen, directors, other actors, and mechanicians that crowded about him while he pretended to be a Jewish boy singing devoutly in the choir or fondly patting his mother in an obscure flat in the Ghetto. Out of all the labor and confusion what had come? The smart audience wanted to know. But most curious of all were the Warner Brothers. This picture had cost them more than $500,000, and there were less than 100 theatres in the whole wide world where it could be shown. Would the sensation be great enough instantly to cause 100 other theatres to wire themselves? But Warner Brothers' gamble was even greater than that. On the development of sound they had at this point invested about $5,000,000, and this was the final test. For while *The Jazz Singer* was not a talkie, it was the first full-length film drama containing sound as part of the dramatic action. If this excited the public, then Warners with an *exclusive* contract with Western Electric had an unbeatable lead on the entire movie industry and might make hundreds of millions of dollars. If this failed to excite, then the chances were that the Warner Brothers were through.

The actual making of *The Jazz Singer* was supervised minutely by Brother Sam Warner. He had finished it in August. From Hollywood he dispatched the film and sound records to Senior Brother Harry in New York. He expected to come on to the opening, but on October 1 he went to the hospital. Pneumonia. Brothers Jack and Albert were at the bedside. Next day the news was so bad that Brother Harry left New York for Los Angeles. At short intervals across the continent he got bulletins about Brother Sam, who was not only the most beloved of all the brothers, but also the one who had first seen the possibilities of sound and had done most to develop it from apparently hopeless beginnings. In Arizona, Brother Harry got a special train. When he arrived in Los Angeles the morning of October 5, Brother Sam had been dead three hours. On the night of October 6 *The Jazz Singer* opened on Broadway.

Born in a cloud of theatrical glory and under the shadow of death, the career of sound was from that moment dramatic in each and every detail. For example, there was the matter of the noises that would get into sound records, despite all human precautions. One sound record was unexpectedly found to contain the words "This is Station ZXZ"—so sound recording had to be insulated against the inaudible inference of radio waves. But particularly baffling was a continuous buzz that seemed to pervade all sound records. The Western Electric experts could find no explanation. One day Old Frank Murphy (old only in Warner service: a mechanic Brother Sam had picked up years ago) was called in. He

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looked, looked, looked, finally said: "The lights." From that moment Klieg lights were doomed, and today only incandescent lights are used in Hollywood—quiet but terribly hot, making paint melt on the face. (But, also, incidentally these new lights do not require the ghastly extremes of make-up with which silent cinema actors used to be plastered.)

The Jazz Singer was a tremendous hit. Jolson's "maaamie" came out in a glorious thunderous plaint, his vulgar negroid lips trembling visibly while the notes echoed. But it was not the songs which made *The Jazz Singer* historically famous. It was one line—one spoken line, which happened by accident. Out on the Hollywood lot Jolson had stepped up to the microphone to sing. In order to re-create the correct mood he had said, "Come on, Ma. Listen to this." The recording device had begun too soon, accidentally recording those words, and the director had decided they might as well be left in, even though all the non-song part of the picture was silent. The night of October 6 the smart folk were thrilled by the most famed of all blackfaces visibly singing before them, but what took them out of their seats was that one remark in the natural Jolson speaking voice. That made them forget mechanism. That gave them the complete illusion of Jolson's physical presence. From that moment the silent picture was as completely doomed as the lantern slides, with which Warner Brothers had begun their astounding career—from poor sons of a Polish immigrant in Newcastle, Pennsylvania to impresarios of the fastest revolution in industrial history.

And the new epoch

But on October 7 the big producers (Paramount, Fox, M-G-M, United Artists) were not convinced or at any rate refused to admit that they were. They said *The Jazz Singer* merely proved that songs by Jolson could carry one whole picture; they ignored that one true talkie sentence. But the Warners were convinced. They immediately introduced talkie sequences into the three pictures they then had in production (*Glorious Betsy*, *Tenderloin*, *Lion and the Mouse*), and in February, 1928, they released the first all-talkie: *Lights of New York*. For this last, great credit must go to Bryan Foy, who for a year had been getting out talkie "shorts." These shorts had taught him how to do it. By spring of 1928 the dam had burst—big producers could no longer resist the infatuation of a public for what it correctly sensed to be a new epoch in the film theatre. But it was autumn of 1928 before any producers except Warner Brothers could get even so much as some talking sequences into their pictures. And by that time they were out with Al Jolson's *The Singing Fool*, were making all their pictures all-talkie. The year's start had put millions in their pockets—some eight or nine during the year 1928. *The Terror* (Louise Fazenda) had netted $110,000 after it had played in just *one* theatre—Warner Brothers, New York. *The Singing Fool* grossed $40,000 a week for months at the Winter Garden. All of which in one year took Warners from among the least to among the greatest of all movie companies. They bought out First National and the Stanley Chain of theatres. Their assets increased from $5,000,000 to $160,000,000 in two years. Last year they bought out several of the leading music merchants of Broadway, as well as a producer of Broadway plays.

But now, the autumn of 1930, Warner Brothers are far from having a monopoly of the art which they invoked and induced. During 1929 all the other producers, with harrowing expenditures of nerves and money and ingenuity, caught up with them by transforming themselves from silent to talkie. Western Electric persuaded Warner Brothers to alter the terms of their exclusive contract. Between Western Electric and Warner Brothers some feeling now exists. Without inquiring into the rights and wrongs of this matter, it would seem that such a colossal development could not be left as the prerogative of one concern. But as it is, Warner Brothers get 3 per cent of all the money taken in by talkie licenses—a great pain, of course, to their competitors. The adaptation of talkie was just as remarkable in the case of those who followed Warner Brothers, for while they borrowed much of the experimental knowledge, they had to absorb it much faster. Consider Paramount. In 1928 it released seventy-eight silent pictures, no talkies. In 1929 it released twenty silents and forty-seven talkies. In 1930 it released sixty-five talkies, no silents. (These are full-length

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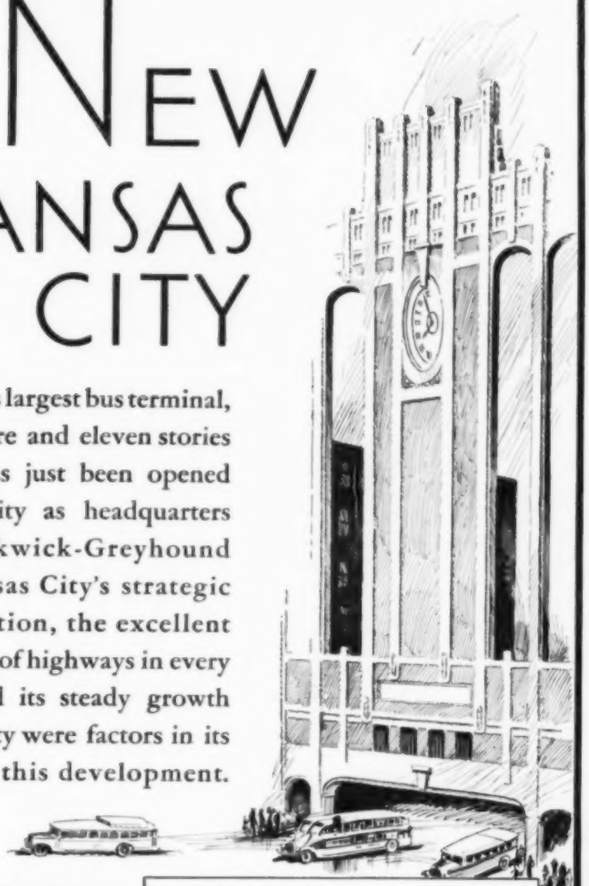

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pictures and do not count news reels, comedies, cartoons, etc.)

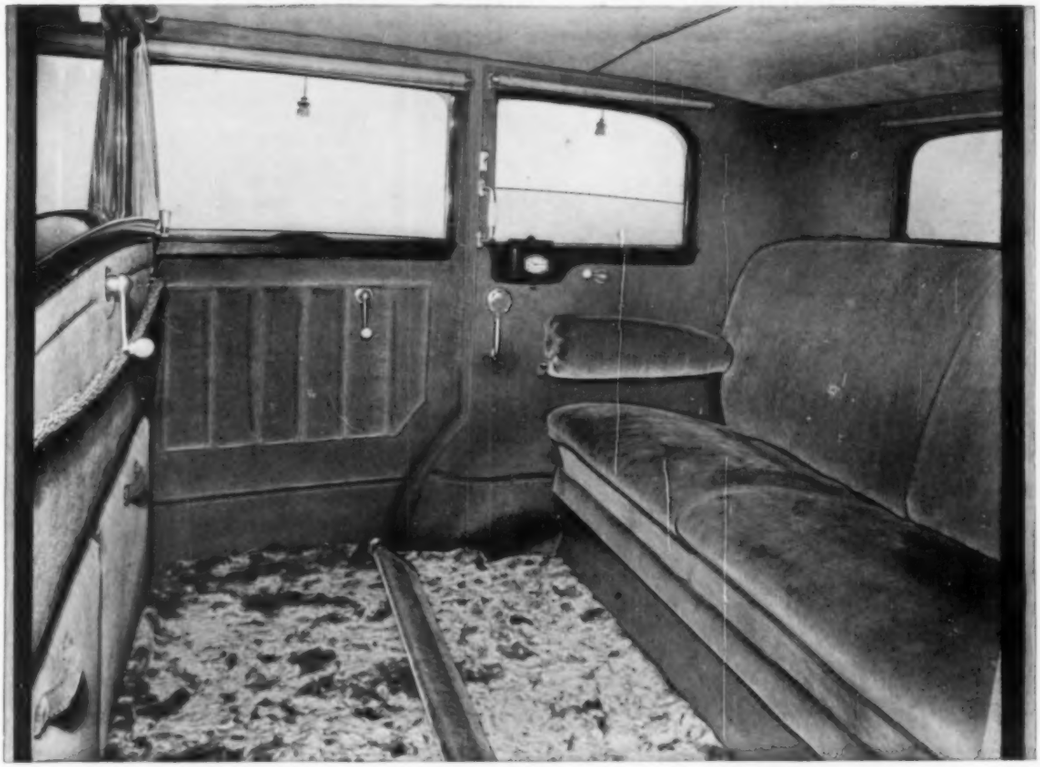
So great was the public's infatuation that in 1929 every producer made big money and, far more remarkable, nearly every single talkie made money. Net profits for leading concerns:

	1929	*1928*
Warner	$17,271,805	$2,044,842
Fox	9,469,050	5,957,217
Paramount	15,544,544	8,713,063
Loew's	11,756,956	8,568,162

But now, as we have said, the first golden harvest is past; the public is taking its talkies critically. And meanwhile, new problems present themselves, the most obvious being that of foreign markets. In its Paris studios, Paramount is making each picture in four or five different languages, each with a different cast. Where the original English picture cost $400,000 or $500,000, the "translations" cost $50,000 or $75,000 each. The Spanish version may well repay the extra cost from the South American market. But it does not pay to make a version in Czechoslovakian. Thus, while the revolution in the greatest of all show businesses is a completely accomplished fact, there remain the resultant problems otherwise known as "gambles."

It is probably true that the greater complications of the talkie and color (as well as other mechanical developments such as "wide film" and the newly announced stereoscopic effects of the Spoor method) will make it harder to make money out of movies. A few small firms are making good money (Tiffany scored heavily with *Journey's End*). But it is no longer a business for the lone adventurer. Not only have mechanical developments speeded the logical concentration of the business into a few hands, but the whole character of the business has changed by reason of the control of theatres by producers. With complicated finance as well as mechanics, it is natural that the hand of the trained financier should be more evidenced: Kuhn, Loeb in Paramount, the "electric interests" in Fox and RKO, Goldman, Sachs and recently Hayden, Stone in Warner Brothers. But let no one suppose that these financiers intend to run the show business. They know enough to know that only a showman can make a movie which even they themselves would care to see. So it would be a mistake to credit financiers for subsequent success or failure of any company with respect to gate receipts. There is, for example, the question of stars.

For years, producers have been "trying to get rid of the star system." They had good reason: the big stars were demanding everything in sight and jumping their contracts when something more appeared. The talkies gave producers an excellent chance to reduce the importance of stars, and it was further thought that the Wall Street influence was strongly against the fantastic Hollywood salary scale. But as the first all-talkie year comes to a close, one fact looms: the stars of silent days are surprisingly intact. Of the thirty or forty leading names and faces, all but half a dozen are names and faces which had achieved a momentum of public favor over a period of years. Thus in spite of the completely new deal which talkies represented, it was not so easy to put over the unknown face or name. And together with this fact is a growing conviction: that there will arise talkie stars whose magnetic influence upon the public will exceed anything ever seen in the days of Chaplin or Pickford. Cost what he or she may, the company which has him or her on contract will earn its dividends on a picture or two, while other companies bite the dust for their lost opportunities. Certainly the showman, his imagination fired by such a prospect, must not become hysterical in reaching for this or that star. But actually he knows that the star system is immortal and universal, operating from Lillian Russell in the nineties to Mei Lan-Fang in China to the Greta whose picture could be advertised simply and solely by saying: "Garbo Talks." Executive and financial committees can prevent the system from disrupting the industry, but they cannot fundamentally alter the system. On pages 36—43 FORTUNE describes some of the cinema actors who are found to be most successful at this stage in talkie-development. Leaving aside such special performers as operatic tenors or Will Rogers, this list represents the first winners in the race for popularity in the photographic spoken drama. None of them commands the adoration given to silent stars of four or five years ago, and perhaps none of these ever will. But as the first to succeed in a new art, they have a collective historical value which no later and greater group can equal.



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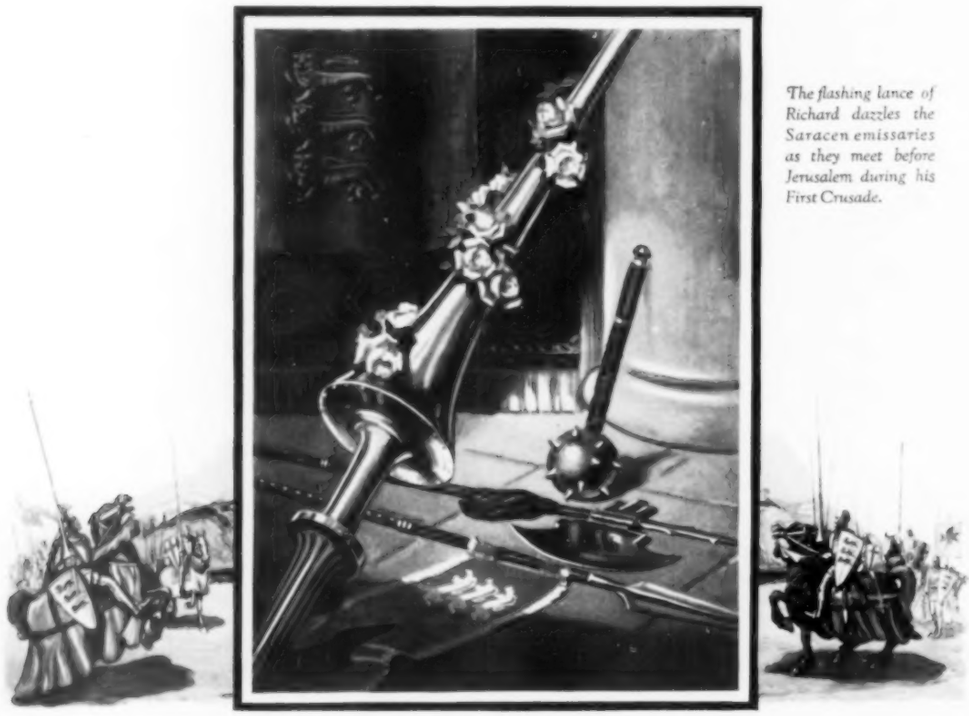

The flashing lance of Richard dazzles the Saracen emissaries as they meet before Jerusalem during his First Crusade.

Lance of Richard. Painted by Ludwig Gassner

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Two Able Britishers Work Effectively in Food, Finance

SCARCE, recently, have been British financial achievements. Between loss of gold and lack of jobs, news originating in the British Isles has been largely bearish. Last month, however, two sons of Britain recorded notable financial accomplishments. To Sir Otto Niemeyer, of the Bank of England and the League of Nations financial committee, went credit for helping Australia out of a bog of near-bankruptcy. To Major Colin Cooper, of International Tea Company Stores, Ltd., went credit for promoting a British retail grocery merger resulting in a 6,000 unit chain. The U. S. observer was concerned with Sir Otto's performance because of $150,000,000 U. S. dollars invested in Australian bonds, in Major Cooper's as an instance of a vertical merger rarely seen in this country.

Australian difficulties were cumulative rather than unexpected. Australia has a population of about 6,500,000 and an area of some 3,000,000 square miles. About 37 per cent of the people are farmers and herders, with wheat and wool the chief Australian exports. The city population (63 per cent) has until recently been very prosperous, aided by a tariff, a state program of public works, a system of fixed minimum wages, and other expensive and paternalistic governmental measures. With the city dweller importing high-priced foreign manufacturies and the farmer and herder selling wheat and wool on a constantly falling market, Australia's imports have exceeded exports, and the lower the prices of commodities, the more unfavorable the trade balance. Furthermore Australian Cabinets, apparently with a haphazard financial policy, continued to borrow money at the rate of about $200,000,000 a year, until the federal and state governments together had an indebtedness of about $5,000,000,000, of which more than $500,000,000 has matured or is maturing in 1930. Widespread unemployment recently became a further grave complication.

Thus the present Australian Government (a Labor administration headed by Prime Minister James Henry Scullin, wavy-haired Irishman) inherited almost insoluble difficulties. Last summer was made a violent but belated effort to adjust the trade balance by absolute prohibition of a long list of imports, but the door was padlocked after the horse had been stolen. When Sir Otto was called in to see if the Bank of England could keep the Down Unders from going under, he found some $180,000,000 in early and unmeetable securities. Shocked was Sir Otto, who, though only forty-seven, has been a man of finance for twenty-four years, entering the service of His Majesty's Treasury in 1906 and holding the position of Controller of Finance from 1922 to 1927. He told Australia that it was off its budget equilibrium and its exchange equilibrium and that no dominion, not even India, had a lower credit. Having scolded, Sir Otto then helped. An arrangement was made whereby the Bank of England will take up the various items of the $180,000,000 indebtedness as they fall due, replacing them with long-term obligations which Australia should eventually be able to meet. Meanwhile the Australians agreed to eliminate various civil service offices and to reduce the salaries of other public servants, also to publish a monthly financial statement. Sir Otto, his work accomplished, sailed from Melbourne, leaving behind him a warring Cabinet, part of which wished to reduce jobs and salaries, according to the agreement, but with an Opposition which maintained that there was no method of making the budget balance anyhow and that fewer jobs and smaller salaries would be only a futile and painful gesture.

• • •

Major Cooper's chain-making (or rather chain-combining) accomplishment unified five large British retail grocery chains in a consolidation capitalized at $57,000,000 and known as Allied Stores. Three of the five chains represented in Allied—the Home & Colonial Stores, the Maypole, and the Meadow Dairies—are controlled by Lever Bros., soap-makers, who will reputedly have a 20 per cent interest in Allied. A fourth chain is Lipton's, Ltd., from which, however, Sir Thomas Lipton has withdrawn, and the fifth is International Tea Co. Stores, Ltd., which Major Cooper personally and entirely purchased for more than $10,000,000. Allied Stores represents control of retail trade by the producer, thus eliminates the wholesaler from the greater portion of the retail food industry, and is altogether different from the U. S. horizontal merger exemplified by General Foods and Standard Brands. The only U. S. counterpart is the Great Atlantic and Pacific Tea Co., in so far as the A. & P. organization has gone into the production of the merchandise it retails [FORTUNE, July, 1930]. As U. S. food chains continue to grow, however (and, in growing, to push their private brands in preference to nationally advertised products), it is possible that the U. S. makers of nationally advertised food-stuffs may be forced into the retail field in order to retain their distribution.

"I bought it (International Tea) as my own principal and paid for the whole lot," said Major Cooper, who is six feet tall, plays squash and tennis every morning, served in the Royal Flying Corps during the War (in which two brothers were killed), and after service in France rose to the command of British aviation in India. His father was the late Sir Alfred Cooper, millionaire founder of the Star Tea Company. Discussing Allied affairs, Major Cooper said that great companies were needed to buy the best brains and that no effort would be spared to endow Allied with the finest executive talent. Public school men, added Major Cooper, were desirable, but many were inclined to favor entering the professions. "There is nothing," said Major Cooper, "to be ashamed of in going into business. I certainly am not ashamed."

Kreuger Into Phones, Copper

IN THE life of Stockholm's Ivar Kreuger, every month is a very busy month. The affairs of Kreuger & Toll are always in a state of motion. And so are the affairs of its subsidiaries, which include Swedish and International Match, the Grangesberg Iron Mines (Europe's biggest), several large banks, pulp, timber, real estate companies, and many lesser and incidental corporations. Last month, however, tall, pallid Herr Kreuger turned his attention to more things and bigger things than usual.

Kreuger & Toll is of course Sweden's richest, most powerful, and best-known enterprise. But another Swedish concern enjoys world-wide reputation, and because it often delves into the same realms of finance as Kreuger & Toll, it is a company Herr Kreuger has watched with interest. From now on his interest will be much more than casual.

This other corporation is the L. M. Ericcson Telephone Co. It began as an equipment manufacturer, a business it still carries on through several large plants. But it also operates telephone concessions, one on this continent (Mexico), one in South America (the Argentine), and a half dozen in Europe. It is a direct competitor of America's International Telephone & Telegraph, and for that reason patriotic Swedish financiers were alarmed recently when they heard that I. T. & T. was angling for the control of Ericcson. To defend Ericcson, they set up a stockholders' defense committee, the need of which was eliminated last month when Herr Kreuger obtained sufficient stock to give him representation in Ericcson. This sufficiency turned out to be enough to enable Kreuger & Toll to direct Ericcson's future affairs. The deal will give Ericcson the benefit of Kreuger & Toll's vast financial resources and of course makes Kreuger & Toll even greater in international finance than hitherto.

A deal that will further strengthen Kreuger & Toll's vital position in Sweden was likewise revealed with the news that the bankers in back of the new Boliden copper mines (in the northeast part of Sweden, close to the Baltic) have sold their stock to Kreuger & Toll. The amount of stock is said to have reached five-sixths, enough to make the Boliden mines an intimate part of Herr Kreuger's structure. Great reserves of ore are already located in these mines, and construction of modern refineries promises to make them very important to Sweden, for most of the crude ore previously has been exported to Germany and the U. S. (Tacoma, Washington).

Another new Kreuger & Toll step also appeared last month in the well-credited reports that it was participating with leading European banking interests in the formation of a colossal investment trust. The trust's aim will not be investing as such so much as financing European enterprises. One of its aims is said to consist of removing Europe's dependency on American capital.

Meanwhile, the regular Kreuger & Toll routine (which last year earned $29,000,000, 38 per cent more than in 1928) continued. Swedish Match obtained a thirty-year Guatemalan match monopoly by buying $2,500,000 worth of 7 per cent Guatemalan bonds at 90. Four-fifths of this money will be used to establish a Guatemalan farm mortgage bank, the rest for public works. And of even more routine nature was the payment of $16,500,000 to Germany, first installment on a $125,000,000 loan.

Pacific Coast Shipping Active

THE new Japanese liner, *Chichibu Maru*, recently docked in San Francisco harbor with $7,000,000 worth of silk in her hold, the largest silk cargo ever to enter the port. Her arrival was an impressive opening to the gayeties of San Francisco's Harbor Day. Every year the premier port of the Pacific Coast celebrates Harbor Day. This year there were boat races in the harbor between picked crews of merchant vessels, general open house all along the waterfront, an air circus put on by the Navy, and some brilliant fireworks after dark. The main event was the grand parade through the city streets in which the various Pacific Coast shipping companies had their floats and to which several thousand bluejackets from warships in the harbor lent a martial air. The parade was marshalled by the grand old man of Pacific shipping, Captain Robert Dollar, eighty-six year old founder and head of the globe-encircling Dollar Steamship Lines.

Every seaman and shipowner on the Pacific knows shrewd, pious, old Captain Dollar. And nearly every merchant in Shanghai, Yokohama, Singapore, and several dozen other oriental ports knows the Captain. His annual tours are as established phenomena in oriental waters as the monsoons. Stopping in at the ports touched by his boats, he makes personal calls on Dollar shippers, actual or prospective. Perhaps no other American is as popular in the East as is Captain Dollar. He set out this year on September 20 for his thirty-sixth oriental tour. "I'm going on this trip to work and not for my health," he said. "I expect to call on all my friends, business associates as well as competitors, as I always do." With him, as always, went Mrs. Dollar.

The Pacific-crossing record, established in 1923 by one Canadian Pacific liner, has been broken by another. The new *Empress of Japan* (26,000 gross tonnage, $7,500,000 cost) made the crossing from Yokohama to Seattle in eight days, six hours, and twenty-seven minutes. This is four hours, twenty-six minutes better than the old record made by the *Empress of Canada* [FORTUNE, September, 1930].

Baseball Bats .400 in Slump

THE strength of "entertainment" stocks during periods of general depression is one of life's minor mysteries. It may be that a theatre ticket (particularly a cinema theatre) hardly represents money to the person who makes or loses amounts significant on Wall Street, or it may be that a tap dance or a chorus girl provides the depression victim with forgetfulness and relaxation. At any rate, 1930 has been no bad year in the entertainment business, and baseball, traditionally the national game, has experienced one of the most successful years in its history. For some years now it has been conventional to regard baseball as somewhat the victim of the many other sports, especially golf, which have risen to compete with it. During the present year, however, the two major leagues have each taken in approximately $5,000,000, which means that the sixteen major league clubs have played to nearly 5,000,000 customers. Baseball club-owners do not give out detailed attendance figures, but maintain that the 1930 record slightly exceeds that of 1927, the best previous year.

Chicago has been for some years the best baseball town. Its American League team, the White Sox, has been hopeless for ten years, but in the National League, during the *régime* of Owner William Wrigley (gum) and Manager Joseph McCarthy (baseball), the Cubs, 1929 champions, have been consistently popular and have taken in more than a million dollars during each of the past four years. Other National League clubs especially prosperous during 1930 have been Brooklyn, which occupied first place during the greater portion of the season, and New York, which nearly always has a good team and shows a tidy profit. It is probable that both the Dodgers (Brooklyn) and the Giants (New York) passed the million mark in receipts and in attendance. Toward the close of the season the New York club announced that John McGraw, manager since 1902, had been engaged for the next five years at a contract reputedly calling for $70,000 a year. Next to George Herman (Babe) Ruth ($80,000), Mr. McGraw is baseball's highest paid employee, and as Mr. Ruth's contract has only another year to run, and will almost certainly not be renewed at anything in the neighborhood of $80,000, Mr. McGraw will probably be highest paid baseball man in another twelve months. Broadly speaking, baseball teams make money when they win and lose money when they lose; thus the two Boston clubs—both of which have for years finished at or near the bottom of their leagues—have probably been operating at a loss, whereas both New York clubs, also strong contenders, have shown large and steady profits.

Minor league baseball has also enjoyed an exceptional year, especially in those cities which have experimented with night baseball. Des Moines and Wichita (Western League) inaugurated night baseball in the spring of the present year; the innovation has been widely copied, particularly in the south and west. The Pacific Coast League, for example (Hollywood, San Francisco, Los Angeles, Seattle, Portland, Oakland, Sacramento, Missions), which ranks just below the major leagues—Los Angeles is considerably larger than many a major league city—has made night baseball a regular portion of its schedule. Night games are also played in the American Association and the International League (next largest minor leagues) and by many professional and semi-professional teams in smaller cities. Flood-lighting has apparently made the night game altogether practical, although the players themselves frequently object to it. Pitchers maintain that it is difficult to see a ball batted swiftly back at them; on the other hand, however, Mr. Fred Lindstrom, third baseman of the Giants, played an exhibition game at night and, having made several brilliant plays, announced that henceforth he would play daytime ball with a lantern at third base. Night baseball (like night miniature golf) has this year had the tremendous advantage of being a novelty; its success can better be estimated at the end of 1931 or 1932. From all present indications, the major leagues are not likely to take up night baseball in championship games. Except in St. Louis and Cincinnati (where attendance during most of the year was very bad), the owners have maintained that night baseball is not baseball. Why the unemployed congregate at the ball park at a dollar a head remains as yet unexplained.

Bonds Boom

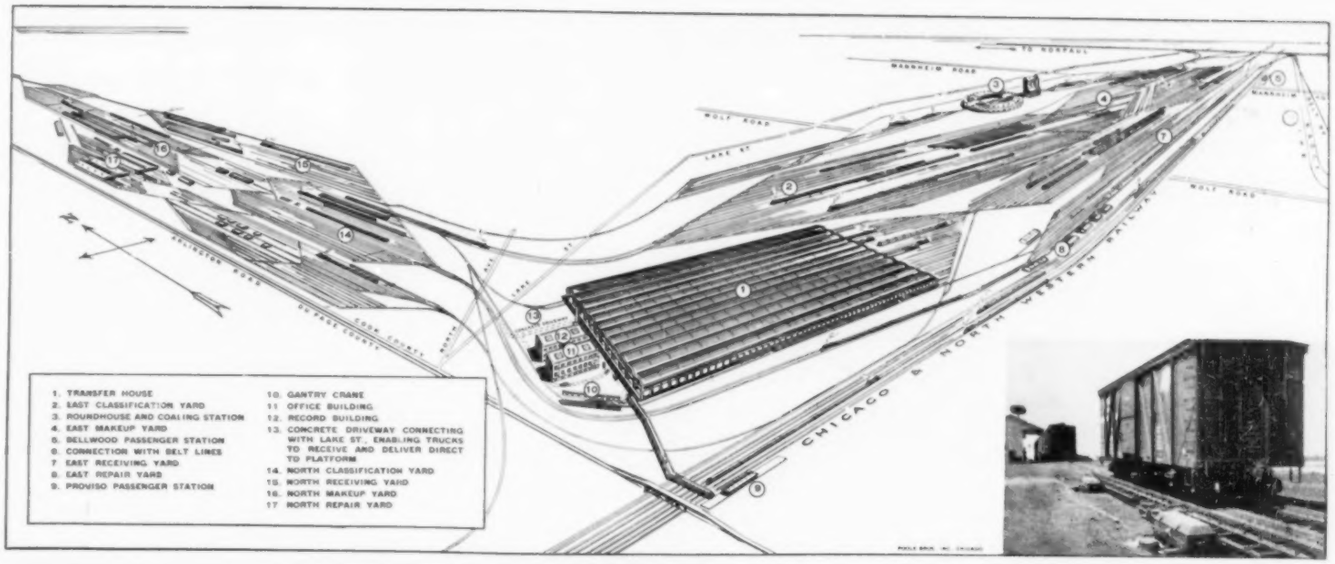
WITH the benefit of a year's perspective, observers of the bond market may well register surprise that the advance in these securities was attended with so much uncertainty. The great surplus of investment funds, correspondingly low rates for credit, and the psychological basis for switching from equities to fixed securities were pointing unmistakably to a rising trend for bonds after the collapse in stock values last October and November. Yet it required about nine months for prices to recover to 1928 high levels for prime issues and the second-grades made heavy weather in trying to participate in the rally.

Artificial respiration applied to industry last winter, combined with reassuring statements from many quarters, served to bolster the faith of a large class of stock owners, who proved to bond salesmen that the investment habits acquired during the preceding two years or so were not to be broken easily. Institutional demand for bonds was rising but the individual buyers were not ready.

It was during the late spring and early summer that the strain began to tell. Bond houses were besought for advice. The conscientious dealer, however, as often as not was hard pressed for an answer. The advice that came most glibly, to place funds in high grade short term securities, awaiting a definite signal from the bond and stock markets, was of little value. Such paper was not to be bought except at most unattractive prices.

There had been, too, an abortive bullish demonstration in bonds in March that had left many buyers, principally professionals, hung up with long lines to be worked off, and there was no sign of a slackening in the supply of new flotations brought to the market by public utility and railroad companies. Yet the investors and traders who followed boldly the traditional signs of a bull market for bonds were rewarded, by the end of the summer, with gratifying profits.

The auguries indicate a continuation of the advance for at least the balance of 1930 and early 1931. The biggest question is whether the second-grade issues will enjoy more popularity. That the market has been mostly in the top rank is shown by the prices of new offerings. Triple-A bonds put out during the first half of the year had advanced three to four points by early September. The "business man's investment" type had slipped back when the syndicate withdrew support.


1. TRANSFER HOUSE
2. EAST CLASSIFICATION YARD
3. ROUNDHOUSE AND COALING STATION
4. EAST MAKEUP YARD
5. BELLWOOD PASSENGER STATION
6. CONNECTION WITH BELT LINES
7. EAST RECEIVING YARD
8. EAST REPAIR YARD
9. PROVISO PASSENGER STATION
10. GANTRY CRANE
11. OFFICE BUILDING
12. RECORD BUILDING
13. CONCRETE DRIVEWAY CONNECTING WITH LAKE ST., ENABLING TRUCKS TO RECEIVE AND DELIVER DIRECT TO PLATFORM
14. NORTH CLASSIFICATION YARD
15. NORTH RECEIVING YARD
16. NORTH MAKEUP YARD
17. NORTH REPAIR YARD
CHICAGO & NORTH WESTERN RAILWAY

Photos Courtesy Chicago North Western

Five-Mile Freight Terminal

AT Chicago, railroad hub of the universe, the Chicago & North Western has just spent $16,000,000 on a freight terminal. Most huge freight yards are jointly owned by two or more railroads. Not so this one, which is said to be the largest individually owned freight terminal in the world. It is five miles long and a half-mile wide, has 230 miles of tracks with a capacity of 26,000 cars. About 15,000 cars are handled daily by a force of dispatchers, switchmen, and engineers which works in shifts twenty-four hours a day. There are four miles of pneumatic tubes to carry waybills, "wheel reports," and letters from one yard office to another. The project has been under construction since 1924.

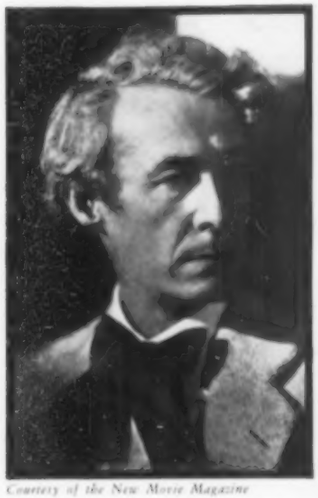
The terminal is located at Proviso, Illinois, a dozen miles west of Chicago's business district. This is where the North Western's main line joins the various belt lines that encircle the city, and is thus a vital point in the railroad's geography. As every one knows, a prime object of traffic men is to route freight *around* big cities rather than *through* them. Therefore freight terminals and classification yards grow up on the outskirts of great cities to separate through freight from local traffic. The Proviso Yards have been built to receive all traffic from the North Western's three main lines radiating out from Chicago, to separate local from through traffic, and to route both on their ways as speedily as possible. It is a great prism that breaks up the flow of traffic into its component parts.

The drawing at the top of the page shows the general layout of the terminal. As in almost every big modern yard, no brakemen ride the cars. Electric car retarders (the inset shows a couple in place along the track) bring each car to a stop in the proper track. Above (right) is the "hump," and (left) a night view of the East Classification Yard. To the left is the interior of the Freight Transfer House, with some of its 4,000 trailer trucks. Its area is twenty-one acres.

Faces of

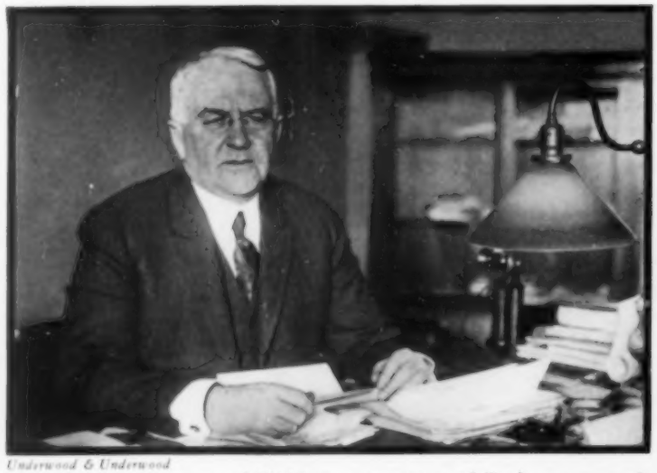
International

Morris Gest, who lately went bankrupt for the first time in his tempestuous, precarious career, has been discharged of his $600,000 debts. None the less he plans to pay his creditors, who include Otto H. Kahn, Publisher Paul Block, Clarence Mackay ($25,000 each), adverticians Lord & Thomas & Logan ($33,000), Bank of America ($50,000), Chelsea Exchange Bank ($49,000).



Courtesy of the New Movie Magazine

Readers of the *New Movie Magazine*, sold for ten cents in Woolworth stores, were pleasantly thrilled by this handsome picture of old-timer Henry B. Walthall in a recent number. Probably no movie rôle is more fondly remembered than Walthall's Little Colonel in *The Birth of a Nation*. Stimulated by the success of *New Movie Magazine* and its fellows, Kresge and another chain store are getting up their own magazine to appear October 1.



Underwood & Underwood

Senator James Couzens of Michigan, most potent of Ford ex-partners, is one of the wealthiest men in the Senate. Yet he frequently votes with the "radicals." On his fifty-eighth birthday the Senator explained this anomaly by telling a story, a very good story, too. He also threw light on the origin of the Ford $5.00 minimum wage schedule: "I confess there was a time when I was not so keen about the rights and interests of the working man. I recall a winter day in 1914, when, with a stroke of the pen, I ordered the discharge of several thousand workers of the Ford Motor Company, of which I was then general manager. I stood in the office window and saw these men milling about, outside the gates. It was bitterly cold and under these conditions I saw the hose turned on them. I got converted right there. After forty-eight hours of discussion, Henry Ford agreed to a raise of wages from $2.30 a day to $5.00 . . ."

International

When King Feisal of Iraq gave Iraq Petroleum Co. (jointly owned by Standard, Shell, and other big companies) monopoly rights to his country's oil, he looked for some $5,000,000 a year in royalties. But to date Iraq Petroleum has taken out little oil and consequently paid little in royalties. Annoyed, Feisal is said to be considering granting new rights to some more rapidly moving oil company.

International

No longer can Harry Wardman boast that one in every ten Washingtonians is housed by him. "The man who overbuilt Washington" has just lost control of all his major hotels and apartments, including the Wardman Park and Roosevelt hotels. Hotels Management and Securities Corp. takes over the $30,000,000 properties.

Blank-Stoller

Goldman, Sachs man on the board of National Dairy Products Co. is now short, smart Sidney James Weinberg. To be elected to an important directorate is by now as little thrilling to Mr. Weinberg as to win the automobile in the trading game at the annual Bond Club picnic. He has been elected to the one seventeen times, has won the other three times.

Small but strategically located is Chicago Great Western, which sprawls like a starfish between Chicago, the Twin Cities, Omaha, and Kansas City. To it have come changes: in October, 1929, Victor V. Boatner (above), veteran railroader who began as a station helper on the Illinois Central, was elected president, and last spring the Patrick H. Joyce interests gained financial control. Beneficial have been these changes, judging from the fact that Chicago Great Western reports a seven-months net (up to August 1, 1930) of $304,000 as against only $92,000 in 1929.

the Month

Underwood & Underwood

With Thomas Hitchcock Jr. as one of the promoters, a new attempt is being made to produce anthracite coal from bituminous—and make money by so doing. Prestcoke Corp. has just put a Chicago plant into quantity production with a low-temperature carbonization process that has been under development since 1925. The process converts one and three-quarters tons of bituminous into one ton of anthracite that undersells real anthracite, is claimed to be as potent.

Underwood & Underwood

Stockholders of New York Steam Corp. were cheered by two items in their company's annual report (for year ended June 30). One was that net was up 50 per cent from last year. The other was a statement by James H. Scarr that, despite the mildness of recent winters, stockholders need fear no definite trend in that direction. Mr. Scarr has been New York's Federal Meteorologist for twenty-one years and has been right 90 per cent of the time. As a boy in Kansas he smelled "twisters" so unerringly that at the word, "Jimmy's running," the whole town made for the cyclone cellars. He has appeared in Manhattan courts around 5,000 times to give evidence as to the weather on a particular day.

P. & A.

On August 31 the contract between the anthracite operators and miners lapsed, but there was no strike. On the contrary a new agreement was signed (to run until April 1, 1936), which both sides hailed as a guarantee of industrial peace. For three hot weeks beforehand a Union Committee had wrangled, bargained, maneuvered with an Operators' Committee in secret session. The man who did most to settle matters amicably was broad-shouldered, forceful Richard F. Grant, president of Lehigh Valley Corp. He is here shown with John L. Lewis, United Mine Workers' president, and some Scranton miners who are offering congratulations. No novice at labor dealings is Mr. Grant. He settled the great anthracite strike of 1925-26 in two sleepless days and nights. He is fair-minded, strong-willed, and knows the strength of the unions—three prime assets.

P. & A.

International

Mrs. Hoover recently smashed a bottle of water against the bow of a boat named the *Excalibur*. Late in September a sister ship, the *Exochordia* will be launched, to be followed by the *Exeter* and a fourth *Ex* as yet undetermined. The boats which cost some $13,000,000 each and can carry 100 passengers, are for Mediterranean service. The face that launched or will launch these ships is that of the aggressive, hard-working Henry Herbermann (above, right), president of the American Export Lines. He started working at ten as a call boy for the Pennsylvania Railroad. By the time the War broke out he was head of his own trucking and lighterage firm. He made trucking history in 1917 when he hauled a German submarine intact from the Manhattan docks up to Central Park to be used as a rostrum for Liberty Loan speakers. He posted blacksmiths along the route to shoe his forty-eight horse team, which he led personally all the way. He has done well in shipping: his line's export tonnage out of New York is greater than that of any other line. Frank Munson (above, left) expects his famed Munson Line to show a net income for the year ended June 30. This is bullish news for any shipping company in these times and especially so for the Munson Line, which depends greatly on unprosperous Cuban sugar for its cargoes. The withdrawal, by mutual agreement among the competing lines, of much tonnage from the Latin America trade accounts for much of the Munson prosperity.

© Harris & Ewing

At the request of worried book publishers, Orion H. Cheney, one-time head of Pacific Bank, is making a trade survey. Among other things, he hopes the various branches of the industry will not continue "to sit in different corners making faces at each other." Genial, adroit, Mr. Cheney may well persuade publishers to come out of their corners.

Henry Miller

On page 133 is told the story of these two able Englishmen and their recent achievements. Above is Sir Otto Niemeyer of the Bank of England, who worked out a plan to extricate Australia from her financial troubles. Below is Major Colin Cooper, "this side of forty," who is the personal six-footer force behind Great Britain's latest step towards rationalization: the $57,000,000 merger of some five food ("tea") store chains operating in the British Isles.

P. & A.

International

WINTHROP WILLIAMS ALDRICH, *born on November 2, 1885, at Providence, R. I., now of Roslyn, L. I.*

International

HENRY PRATHER FLETCHER, *born on April 10, 1873, at Green Castle, Pa., now of Green Castle, Pa.*

International

JUAN TERRY TRIPPE, *born on June 27, 1898, at Seabright, N. J., now of New York City*

Blank-Stoller

HARDEN F. TAYLOR, *born on July 15, 1890, at West Plains, Mo., now of Scarsdale, N. Y.*

© *Keystone*

J LEONARD REPLOGLE, *born on May 6, 1876, at Enterprise, Pa., now of New York City*

International

THOMAS L. CHADBOURNE, *born on March 21, 1871, at Houghton, Mich., now of New York City*

Underwood & Underwood

EUGENE MEYER JR., *born on October 31, 1875, at Los Angeles, Calif., now of Mount Kisco, N. Y.*

Courtesy Kennedy & Co. N.Y.

GEORGE WASHINGTON HILL (*date and place of birth unknown*), *now of Irvington-on-Hudson, N. Y.*

Career Milestones

¶ Five months ago, Winthrop Williams Aldrich became president of the world's biggest bank. Last month he became a director of the world's biggest corporation. What all this has to do with the fact that Mr. Aldrich married the daughter of John D. Rockefeller is a moot point. On occasion he has not hesitated to state that he represents the Rockefeller interests, which he forcefully demonstrated by leading the Rockefeller campaign to oust Colonel Stewart from Standard Oil of Indiana. But even Mr. Aldrich's status as Rockefeller legate cannot take precedence over his status as president of Chase National Bank. Hence his election to the board of A. T. & T. means that Chase National Bank has joined Guaranty Trust and First National on the A. T. & T. board as much as it means the first entry of the Rockefeller interests into the company. It also means a slight readjustment of the balance of power between the three major traditions represented on the A. T. & T. board: the New England tradition of family, the Wall Street tradition of finance, and the public service tradition. W. Cameron Forbes, who resigned from A. T. & T. on his recent appointment as Ambassador to Japan, represented the first and third of these. Mr. Aldrich, his successor, obviously represents the second, and, as son of a distinguished Senator from Rhode Island, also is included in the first.

¶ A milestone in the career of a "career man" was the appointment by President Hoover of Henry Prather Fletcher to the chairmanship of the Tariff Commission. Entering the diplomatic service as a secretary to the U. S. Legation at Cuba, he left it somewhat over a year ago as Ambassador to Italy. In the interim he had successfully met so many extraordinary diplomatic exigencies (including the conducting of President Hoover's South American tour) that he is called "The Handy Man of the White House." Certainly the President never needed the ability and diplomacy of his Handy Man more than as head of the Tariff Commission. Mr. Fletcher's background seems ideally balanced for the job. He is both internationally minded and a Pennsylvania Republican.

¶ Juan Terry Trippe is as quiet and unassuming as his friend, Charles Augustus Lindbergh. He is also as tall, in industry fully as potent. Since he was graduated from Yale Sheff in 1920, he has been lacing air lines around and across the Western Hemisphere. In 1923 it was Long Island Airways. By 1926, he had taken in New England with Colonial Air Transport. In 1927 he and his associates formed Pan-American Airways and took a giant stride towards what is today almost their private domain: South America. The stride was a line from Key West to Havana. By 1929 Pan-American lines ran down the west coast of South America as far as Santiago, Chile, down the east coast only to the Guianas. Mr. Trippe and his associates have remedied this lack of balance and incidentally bought out their only serious competitor in South American air travel by acquiring the assets of NYRBA (New York, Rio & Buenos Aires Lines). This makes thirty-two year old Mr. Trippe head of the world's biggest air line, whose planes fly over 100,000 miles every week.

¶ The Atlantic Coast Fisheries have just elected as president the Man Who Knows Most about Fish. A scientist before he was a man of business, he was first interested in fish, then in profits, which may be why he has been able to bring Atlantic Coast Fisheries up from a moribund state to rank with giants like General Seafoods and Booth Fisheries. He began his career by studying molluscs, and he says that he would like to spend the rest of his life studying diatoms, which are a species of algæ much in demand by hungry fish. He is a chemist as well as an ichthyologist. In working out (with A. H. Cooke) his process for freezing fish in forty minutes, he drew on both these funds of knowledge. It is this quick-freezing process that more than anything else has set Atlantic Coast Fisheries so firmly on its feet again. The name of this small, sandy-haired, enthusiastic ichthyologist is Harden F. Taylor. In his time he has been burdened with such titles as Chief Technologist of U. S. Bureau of Fisheries and Assistant for Developing Fisheries and Saving and Use of Fishery Products. But he prefers talking about the fish and chemicals that are in the sea, which he does in a most engaging manner, to dwelling on his titles and achievements, past or present.

¶ Sick British steel and sicker Cuban sugar have both called in American doctors. The doctor at steel's bedside is the colorful J. Leonard

[*Continued on page 140*]

Hearst Buys More Art, Pleases Britishers

WHEN an American buys a noted example of British art and transports it to America, he is heartily damned by the English press and public. But when an American buys British art and keeps it in England, he is blessed with equal heartiness. These axioms were amusingly illustrated in the recent sale of the Great Chamber of Gilling Castle (above), which contains a great deal of exceptionally fine Elizabethan paneling and stained glass. Efforts to sell it at Christie's having come to naught, the press at last announced sadly that it was to be dismantled and packed off to America. Typical headlines were: "Castle Masterpiece for U. S. A." and "Off to the States." Then, when gloom was at its deepest, came an amazing report: William Randolph Hearst had bought the room and was going to install it in his Welsh estate, St. Donat's Castle. At once, the press burst into a pæan of thanksgiving, the burden of which was the headline: "Saved from the U. S." It was possibly the only time on record that the English press has wholeheartedly praised Mr. Hearst.

It was Sir William Fairfax who decorated the Great Chamber in 1585. Heraldry seems to have been his hobby: not only are his own arms emblazoned in full colors over the fireplace, but the Royal arms of Elizabeth are put over them (though somewhat smaller), and on the room's broad freize are painted 450 shields displaying the arms of the gentry of Yorkshire.

St. Donat's Castle, where the room will be installed, is fast becoming the principal storehouse for the amazing hodge-podge of valuable impedimenta with which Mr. Hearst delights to surround himself. He plans to fill the grim old fortress with the pick of his English antiques: the Sparkford Room from Hazelgrove House, some panels from Albyns, woodwork from Heronden Hall, the famed Bradenstake barn, some windows from St. Albans, Henry VIII gold shoes, some old silver from the famed Barnet Lewis Collection, and so on. Varied though it is, this list is quite monotonous compared to the full roster of the Hearst acquisitions. With a magpie-like lust for possession, Mr. Hearst has collected thousands on thousands of miscellaneous antiques. He has two magnificent mummies that are unrivaled even by the British Museum. He has 17th century Spanish royal tapestries. He has 13th century choir books. He has Renaissance carved tables. He has 15th century Italian choir stalls. He has 7th century ceiling frescoes (now in the tower suite at his Californian ranch). He has a whole series of English Henry VII beds. He has—but the list is endless. Only in the depths of Mr. Hearst's own memory are his possessions fully catalogued. There, one may be sure, King Henry's shoes are as meticulously recorded as the Veronese church which Mr. Hearst had taken apart for shipment in 1926. The Great Chamber is thus the most recent arrival in an already crowded seraglio of antiques.

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to
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Theo. DeWitt
Vice Pres. & Gen. Mgr.

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Fire, Automobile and Tornado Insurance for Select Risks

Career Milestones

[*Continued from page 138*]

Replogle. He it was who sold Cambria Steel to Midvale Steel and who organized the very profitable Vanadium Corp. As director of Steel Supply during the War, he revolutionized the lingerie of American women by cutting down on the corset makers' steel allowance. After the War he organized Replogle Steel Co., made a fortune when its stock went from 50 to 93 and lost it in the market crash of 1920 when it fell back to 30. His friend, Charlie Schwab, likes to tell how a stick-up man once blackjacked Replogle and, finding on him nothing except a 1,000-share certificate of Replogle Steel stock and a package of cigarettes, took the latter. Mr. Replogle, now retired, lives well, spending six months of the year in Palm Beach and most of the remainder in Europe. While Mr. Replogle lay ill abroad last year, a group of British steel-makers asked him to draft a plan for the reorganization of the industry. Bored with lying idle in bed, he did so. His plan has just been made public. Its first remark is: "Practically all English blast furnaces are obsolete and should be scrapped . . ." and the rest of the report is equally to the point. Even primogeniture, almost as sacred among British steel-owners as among British land-owners, is bluntly termed "one of the principal reasons" for the industry's poor health . . . The Cuban sugar industry has called in as a sort of a doctor-dictator a six foot six American lawyer: ruddy-complexioned, impressive Thomas L. Chadbourne, senior partner of the potent firm of Chadbourne, Stanchfield & Levy. Like Doctor Replogle, Doctor Chadbourne lives well. He takes long cruises on his 175-foot yacht, pungently named *Jezebel*. He spends most of his time abroad (his summer home is a château in France) or in the South, coming to New York only when he must. In the present instance, he is glad to come, for like most big men, Mr. Chadbourne likes big jobs. He has certainly never had a bigger. Should he succeed in guiding to a satisfactory solution the sugar growers who have been meeting in his law office, Mr. Chadbourne will be more elated, his prestige will be greater than even after his last year's victory over Sir Hugo Hirst of British General Electric.

¶ To succeed Roy A. Young as governor of the Federal Reserve Board, President Hoover has chosen a versatile and extremely able public servant: Eugene Meyer Jr. Up to thirteen years ago Mr. Meyer had his own private banking house, and a highly successful enterprise it was. If there is one thing Mr. Meyer shines at more than another, which by the way is a doubtful hypothesis, it is the investing of money. A member of a wealthy French family, he started out with a sizable fortune which he has since doubled and redoubled many times. He picked U. S. Steel as a good buy many years before the War boom and reaped a goodly reward for his judgment. Like many another potent man of business, he went into governmental service during the War, but unlike most other business men, he did not return to his private potato patch after the War. Instead he shut up his bank, retired from all his directorships, and has served his country since than as director of the War Finance Corp. and as Farm Loan Commissioner. He knows a great deal about a great many subjects from farming and non-ferrous metals to Chinese art. His new appointment may justly be considered the climax of his public career. It means that Secretary Mellon, ex-officio chairman of the Federal Reserve Board, will work smoothly with Governor Meyer, who happens to be his old and intimate friend. And it means, more than anything else, that Wall Street's influence on the Board will be increased.

¶ With the year three-quarters over, it is plain that American Tobacco Company's 1930 net will top $40,000,000, which is about $10,000,000 more than the entire Tobacco Trust made in 1911, the year before it was dissolved. This is a spectacular milestone in a spectacular career: that of hard-fighting, iconoclastic George Washington Hill, president of American Tobacco. Last year he almost broke the 1911 record, falling short by a scant $500,000. The etching shown here is the only picture he will release for publication. It shows the alert expression that is characteristic of him and the battered old felt hat that perches on his head during most of his waking hours. Aggressively, Mr. Hill has carried out his own ideas about advertising, has made the public buy his Cremo cigars and Lucky Strikes in spite of better-bred competition, indignant candy interests, and the Federal Trade Commission. He confounds his critics not with words but with results: a 3,539,000,000 increase in Lucky Strike sales for the first seven months of the year is one of them.

SERENELY BEAUTIFUL ~ FOR ALL TIME

THE MATCHLESS BEAUTY of Rock of Ages granite is as imperishable as the faith and ideals which a memorial should proclaim.

In but a single quarry, cutting deep into a wooded Vermont hillside, is found granite of the fine, hard texture and uniform blue-gray color which distinguish Rock of Ages. Throughout the centuries it will stand unmarred—defiant of heat, of cold, of storm, of time itself.

By selecting Rock of Ages granite, you eliminate all speculation as to the beauty and character of the finished memorial. The Rock of Ages certificate of perfection, which your memorial craftsman will unhesitatingly give you, is an uncompromising guarantee, not only of the material, but of Rock of Ages craftsmanship as well.

Write for our helpful booklet
"HOW TO CHOOSE A MEMORIAL"

ROCK OF AGES

THE *DISTINCTIVE* BARRE GRANITE

ROCK OF AGES CORPORATION . . . BARRE, VERMONT

A *great* motion picture company *enters the* INDUSTRIAL FIELD

WARNER BROS. can give you:

Sound Pictures with sound recorded as picture is taken.

Sound Accompaniment Pictures with sound added after the film is made, permitting sound effects, lecture or musical accompaniment.

Silent Pictures with explanatory titles.

Portable Projectors for sales meetings and conventions.

Point-of-Sale Presentations by means of specially equipped autotrucks. These trucks with self-contained apparatus can present sound pictures on a five by seven foot screen in the open air on street or highway right where you want your advertising to strike home!

What Warner has done for these famous stars, Warner can do for your product with an Industrial Motion Picture.

Warner Bros. lead the field in entertainment pictures. With one bold stride they have now advanced to the forefront of the commercial field.

You now can have an industrial motion picture made by the company that brought the Talking Picture to the world.

Their industrial and commercial department offers you:

Advertising minds to originate the basic sales idea you want to convey, or to work with your agency or advertising department in developing an already determined idea.

Experienced scenario writers to prepare the story for screening.

Technical experts in photography, sound, lighting, and direction to make the picture.

World wide distribution outlets with a guaranteed total circulation of 5,000,000 to present the picture in any territory, to any group you wish to reach.

You can show the manufacturing processes that go into your product, present new selling ideas to your salesmen or dealers, or bring home to your prospects a living picture of your company and what it means.

Or, by the use of a sponsored picture, you can advertise directly to an audience of 5,000,000 people who attend the best moving picture theatres. They cannot miss your advertisement when it is shown on the screen.

The cost of this service is less than you think. Write for illustrated book describing the possibilities of the industrial pictures.

WARNER BROS. INDUSTRIAL PICTURES, Inc
220 West 42nd St., New York City

Please send illustrated book and full details on Industrial Picture making.

NAME_____

COMPANY_____

ADDRESS_____

F10

WARNER BROS.
INDUSTRIAL PICTURES, INC.

A SUBSIDIARY OF WARNER BROS. PICTURES, INC.

220 West 42nd Street
New York City

Branches in 26 Cities in the United States and throughout the World

WHAT WARNER BROS. PROMISE WARNER BROS. DELIVER

This Month's Issue

is reviewed from the stock market angle
by Carlton A. Shively

FOOD for sociological mastication can be found in the action of the "amusement" stocks since the dark days of last October—November. In the scramble for stocks in "depression proof" industries by those who still had a little money, the motion picture shares were bought right and left. On some days the group made up nearly 25 per cent of the trading. They led the spring rise and were only moderately depressed in the midsummer setback. However, the suspicion that even picture theatres had weaknesses finally took hold.

While the enthusiasm was at its height early in the year, most of the picture theatre stocks sold higher than they did in 1929, a feat performed this year by very few stocks. Warner Brothers was one, reaching $80.25 a share, or $15.75 above the best price of last year. Paramount topped last year's best by two points or so. RKO scored with a five point margin; Loew's made it ten points. Fox, of course, which had a bad case of internal disorder and which had been tremendously inflated last year, enjoyed one of the fanciest short interests in the market. They have been pretty well covered since the new management has taken hold, and Fox has kept well up with the leaders of its group.

Since the Fox upset early in the year, trouble has developed in Warner Brothers. The heavy selling which preceded application of a stockholder for receivership last August has been replaced by a saner attitude toward the stock. At the same time it has not acted much as stocks usually do which are associated with the name of John J. Raskob, who is known to have taken an interest in the company about a year ago. Nor is quite so much prestige derived from the company's banking connections, Goldman, Sachs, as once was the case.

Warner Brothers never has had the clever pool management often given RKO on the floor of the Stock Exchange by M. J. Meehan. Mr. Meehan's natural affinity for Radio Corporation, which broadcast his name to the world two years ago, got him interested in Radio's subsidiary, RKO. It didn't reach the price of $75 a share talked for it a few months ago, but it ought to be a winner in the 1931 bull market stakes.

* * *

Perhaps no better illustration of the mutability of stock market fashions can be had than the career of the two sulphur stocks: Texas Gulf and Freeport Texas. Years ago the now virtually defunct Union Sulphur had almost a monopoly of the sulphur business. Its shares reached such heights that they were only for the rich. About the time Union's deposits began to play out Texas Gulf and Freeport came on the scene. Memories of the huge earnings and high prices for Union encouraged speculation in the newcomers. In their heyday on the Stock Exchange, 1926-29, they were the darlings of pool operators and the small trading public. No matter how quiet things might be, it was always possible to hear tips on the sulphur stocks. Some neat little fortunes were made in them.

Both companies had the principal requisites of "trading" stocks. They had the proper banking connections, large stockholders who were willing to turn a hand to stock market operations now and then, the mystery and speculative attraction which always seems to cling to mining stocks, they sold in popular price ranges and their shares outstanding were neither too numerous to be unwieldy nor too scarce to make pool operations difficult or short selling too hazardous. Through its directorate Texas Gulf was and still is associated with Morgans. Freeport was controlled by National City Bank officials, although recently an outside group grasped the reins.

In the market break last autumn Freeport sank to twenty-three and three-quarters, losing about 50 per cent in value. It has recovered 100 per cent from the low price, and is selling about midway between the best and worst of the year.

Recently Freeport has been more active than Texas Gulf, the latter also selling half way between the high and the low of the year, yielding a little better than six and one-half per cent. It fared no better than Freeport in the big break, but recently it has been steadier. Newmont Mining Corporation, the holding company formed a few years ago to take over the major portion of the late William Boyce Thompson's mining investments, is known to have a good deal of Texas Gulf stock and a very close association with the management. The two have a new scheme for sulphur which will remove all worries, for Texas Gulf, over exhaustion of present sulphur reserves. This new development, unknown as yet to Wall Street generally, is just the sort of raw material from which bull markets are confectioned.

EXECUTIVES
WHO ASK QUESTIONS

Some executives hesitate to ask questions. This advertisement is a suggestion for executives who insist on knowing why. ¶ If in your industry, as in most, finishing materials are applied to protect or beautify products that you make or use, ask those responsible whether the finish is nitrocellulose lacquer. If it is not, ask why. *Be satisfied only with reasons based on recent tests.* Nitrocellulose lacquers of today are profitably used in many new and original applications. ¶ Consult the research department of a lacquer manufacturer, and you will be aided in securing the advantages of nitrocellulose lacquer. If existing lacquers do not meet your requirements they may be able to develop a new one for your needs. We will gladly send you a booklet, "The Story of Modern Lacquer," which contains information you should have.

CELLULOSE PRODUCTS DEPT.
HERCULES POWDER COMPANY
(INCORPORATED)
975 King Street, Wilmington, Delaware
Nitrocellulose · Explosives
Cotton Linters · Naval Stores

John Hancock Series

BUSINESS
CREDIT

IF the mainspring of a business is the brains and driving force of some man, there is no surer, quicker way to strengthen the credit position of that firm than by taking adequate Business Insurance on his life.

This matter needs careful consideration. May we, without obligating you in any way, provide some general information on this subject?

Address:

INQUIRY BUREAU

John Hancock
MUTUAL
LIFE INSURANCE COMPANY
OF BOSTON, MASSACHUSETTS
197 Clarendon St. Boston, Mass.

Please send information regarding Business Credit.

Name.....
Address.....
Fr. .....

Over Sixty-Seven Years in Business

GRAND RAPIDS

back to the job

TANNED, invigorated, our tourist guests have gone. We've had a good time with them, here in the nation's playground. Now, back to work! Yes, after hours we drive to Lake Michigan for a dip . . . there are lakes even nearer where the bass hit hard these autumn evenings . . . two dozen golf courses 30 minutes from town. This Michigan outdoors builds pep for the day's job. The boys in the factory get their fun, too, and punch the clock o' mornings with a grin that means production!

WHAT ELSE MAY WE TELL YOU?

If you wish to know other advantages Grand Rapids offers industry, this bank . . . counselor to successful businesses for 77 years . . . will gladly discuss wage scales, traffic rates, factory sites.

OLD KENT BANK

West Michigan's Largest

Index of Advertisers
October, 1930

	Page
Aetna Life Insurance Co.	95
Agfa Ansco Corp.	144
Aluminum Co. of America	104
American Multigraph Sales Co.	146
American Writing Paper Co.	109
Austin Co., The	97
Baltimore Trust Co.	119
Bartlett Tree Expert Co.	1
Bausch & Lomb Optical Co.	16
Bayley Co., Wm.	114
Bigelow, Kent, Willard & Co.	127
Brooks Brothers	106
Browne-Morse Co.	143
Cadillac Motor Car Co.	17
Californians, Inc.	3
Cameron, Viola Root	130
Canadian Pacific Railway Co.	27
Carrier Engineering Corp.	25
Central Mfgrs. Mutual Insurance Co.	140
Central Outdoor Advertising Co.	125
Chase & Co., L. C.	131
Cook Paint & Varnish Co.	126
Cowan & Dengler	13
Cowdin Co.	130
Crane & Co.	24
Dick Co., A. B.	7
Distributors Group, Inc.	122
Dodge Boat Works, Inc., H. E.	III Cover
Ernst & Ernst	117
Erskine Dansforth Corp.	5
Firestone Tire & Rubber Co.	9
First National Bank of Boston	99
General Electric Refrigeration	103
Glen Springs, The	120
Goodyear Tire & Rubber Co.	28, 29
Gruen Watch Co.	2
Guardian Trust Co.	14
Hartford Fire Insurance Co.	113
Hercules Powder Co.	143
Hornblower & Weeks	124
Hotel Hollenden	140
International Mercantile Marine	108
John Hancock Mutual Life Insurance Co.	143
Jones Dairy Farms	144
Kansas City Chamber of Commerce	129
Liberty Foundries Co.	115
Los Angeles Chamber of Commerce	23
Lyon Metal Products	132
McCann, H. K.	4
Matthews Co.	128
Monroe Calculating Machine Co.	121
National Lampworks of General Electric	21
New York Trust Co.	12
Nelson Co., Alfred	127
Norton Co.	11
Old Kent Bank	144
Otis & Co.	120
Packard Motor Car Co.	30
Pinaud, Inc.	110
Plaza & Savoy Plaza	124
Pyrene Mfg. Co.	144
Pusey & Jones Corp.	18
Rand Co.	112
Reynolds Tobacco Co.	IV Cover
Robinson, H. A.	22
Rock of Ages Corp.	141
Scovell-Wellington & Co.	122
Scripps Motor Co.	128
Simonds Saw & Steel Co.	145
Sinclair Oil Co.	116
Sirrine & Co., J. E.	118
Sterling Engine Co.	10
Stone & Webster Engineering Corp.	111
Texas Co., The	II Cover
Thompson Co., J. Walter	107
Tripler & Co., F. R.	20
United Engineers & Constructors	123
Vermont Marble Co.	19
Warner Brothers	142
Westinghouse Electric & Mfg. Co.	101
Wholey Co., Wm. F.	15
Wood Office Furniture Associates	26
Wurlitzer Reproducing Organ	8
Young & Rubicam	93

Milo Jones — Born 1809

JONES DAIRY FARM SAUSAGE

When Milo Jones established the Jones Dairy Farm in 1834 he laid the foundations of a business which is famous all over America for the production of a NATIONAL BREAKFAST AND LUNCHEON DELICACY unique in the annals of Food Products.

Made today just as Milo and "Aunt Sally" Jones made it nearly 100 years ago.

JONES DAIRY FARM
Fort Atkinson, Wis.

In Wisconsin's great dairy center—owned and operated by the Jones Family since 1834.

100 MEMO PICTURES with $1 worth of film

CARRY A MEMO Camera in your pocket — surest, quickest, most convenient still film camera in the world. 50 pictures with one 50-cent daylight-loading Agfa film. Easiest to load. Twick of the thumb advances the film. Spyglass finder locates subject instantly right side up. Memo gets everything on a trip. Wonderful for close-up portraits as well as landscapes. F 6.3 and F 3.5 anastigmat lenses.

Memo pictures are printed on paper exact size, as enlargements, and as projection rolls for a picture show with Memoscope. The new idea in still cameras for greater economy, convenience, utility. Memo $20. Focusing models to $40. For sale by camera dealers. Many thousands of enthusiastic owners. Interesting literature gives full details.

AGFA ANSCO OF BINGHAMTON, N.Y.

Please send me free 56 page Memo handbook

Name_____

Address_____

Rx *Simonds Steel* compounded carefully as a Prescription--

. . . insures the Quality and Uniformity of Simonds Cutting Edges

No PRESCRIPTION is compounded with more scientific accuracy than the alloy and other special tool steels used for Simonds cutting edges.

The Simonds steel mill . . . one of the world's most completely equipped electric furnace plants . . . is maintained for the purpose of making steels of uniform high quality for Simonds products. No steel is good enough for Simonds cutting edges until engineers have given their expert approval . . . until every test indicates that the steel measures up to exacting Simonds standards for toughness, strength and hardness. Simonds steel is "prescription" steel—the finest, most practical tool steel modern methods and improved facilities can produce.

This is the basic reason why Simonds saws, machine knives, Red Streak hack saws and other quality products retain their sharp cutting edges on the very toughest cutting jobs . . . this is the reason why the Simonds name means perfection wherever superior cutting equipment is used.

SIMONDS SAW AND STEEL COMPANY
ESTABLISHED 1832 · · FITCHBURG, MASSACHUSETTS

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Memphis . Tenn.
Seattle . . Wash.
Chicago . . Ill.
Detroit . . Mich.
Portland . Ore.
New York . N.Y.
New Orleans . La.
Atlanta . . . Ga.
San Francisco . Cal.
Los Angeles . Cal.

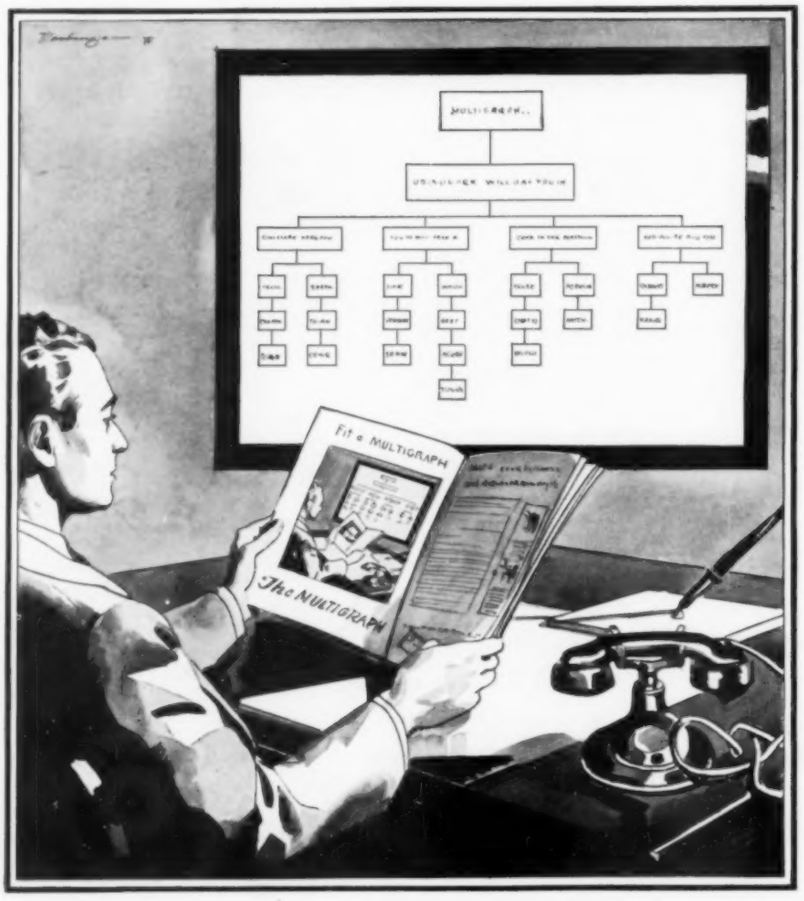
Producers of Circular, Band, Metal, Cross-Cut, Gang and Drag Saws . . . Machine Knives . . . Files . . . Hack Saw Blades . . . Tool Holder Bits . . . Saw Tools . . . Discs . . . Steel.
SIMONDS CANADA SAW COMPANY, LTD., Montreal, Que., St. John, N. B., Toronto, Ont., Vancouver, B. C.
AFFILIATED COMPANIES
WAPPAT, INC., Pittsburgh, Pa., *Manufacturers of Portable Electric Saws and Tools* ~ THE ABRASIVES CO., Phila., Pa., *Producers of Abrasive Grinding Wheels and Polishing Grain* ~ SIMONDS GUARANTEED CUTTER-HEAD CO., Seattle, Wash., *Manufacturers of Guaranteed Cutter-Heads.*

SIMONDS INDUSTRIES
World's Largest Saw Makers

BACK OF THE EDGE . . THE STEEL . . . BACK OF BOTH . . SIMONDS

Fit a MULTIGRAPH MAP to your business

and discover new ways to save

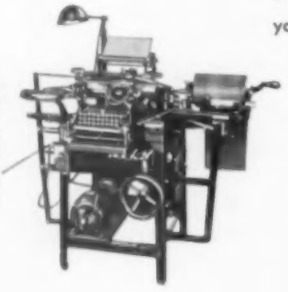


USING the Multigraph is one thing . . . and using it for all it's worth is something else.

Many an organization which makes the Multigraph pay for itself each year as a direct mail unit neglects the opportunity for similar profit by using the Multigraph to print office forms. Others, who use the Multigraph for printing, could greatly enlarge the effectiveness of sales and advertising appropriations and other department budgets by applying the Multigraph to selective selling, follow-up, collections, production records, or similar problems.

That's why we recommend to every executive a searching check-up of the Multigraph map of business—the map of places in which the Multigraph can serve you. Take your own organization chart; go over it section by section; list forms that could be printed on the Multigraph. It won't be unusual if you find the way to save enough to pay at least one clerk's salary . . . and it is not unprecedented to find savings that run into five figures.

Whether or not you now use Multigraph equipment, it will be worth your while to obtain the new bulletin-guide to Multigraph applications—"33 Ways in Which Money is Being Made or Saved by Multigraph Equipment." You can get it from the Multigraph representative listed in your telephone book. Or we will send it direct.



The Multigraph Compotype, either in your own office or through the service made available by Multigraph district offices, gives you the advantage of convenience and economy assured by the embossed strip method of composition for letters and address plates.

THE AMERICAN MULTIGRAPH SALES COMPANY
1834 East 40th Street; Cleveland, Ohio
THE MULTIGRAPH SALES COMPANY, LIMITED
137 Wellington Street, W., Toronto, Ontario

The American Multigraph Sales Co.
1834 East 40th St., Cleveland, O.

Please mail copy of "33 Ways" to:

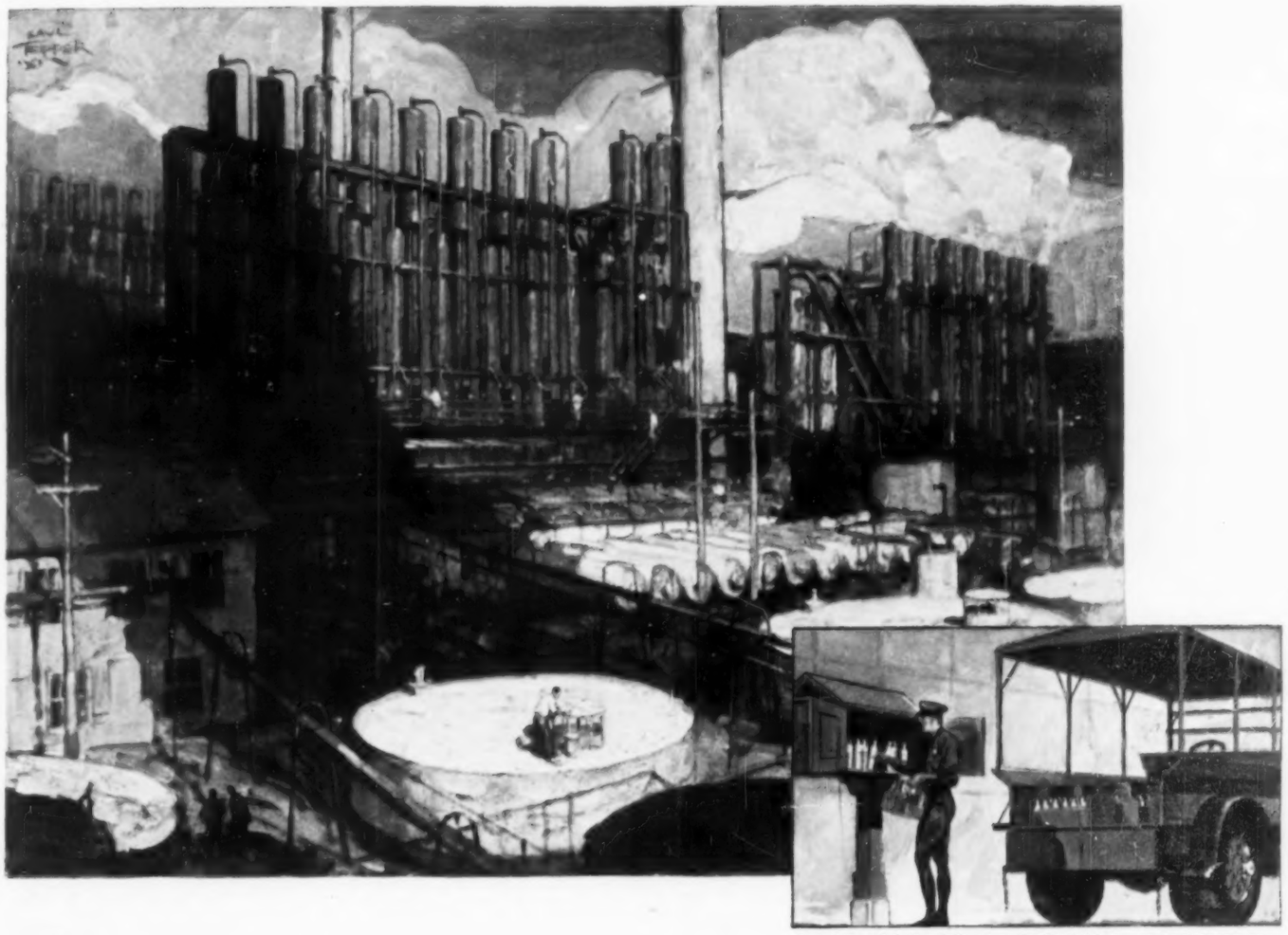
Name .....

Business .....

Address .....

City ..... State .....

The MULTIGRAPH



From dawn to dusk, from dusk to dawn, Sundays, holidays, every day of the year, many trained men make an endless round of Texaco refineries collecting thousands of samples. These are carefully analyzed and the slightest variations from Texaco standards are corrected immediately. 399 tests every hour—9,576 a day—3,500,000 a year are the remarkable figures!

Over 3 million refinery tests a year

TEXACO

The symbol of quality for petroleum products

Scientific care, such as exists in almost no other industry, is daily practiced in the laboratories of each of Texaco's 19 modern refineries.

Thousands of samples constantly pour in from the stills, agitators and filters. Each one is subjected to rigid tests by scientifically trained specialists. Batteries of telephones speed their findings and recommendations on through each refinery unit.

This almost incredible care is typical of Texaco ideals. It accounts in no small degree for the rapid and sustained growth of The Texas Company — for the matchless success of Texaco Products in every industry, not only in each of our 48 States, but throughout the entire civilized world.

Today, leading industrialists and experienced motorists everywhere turn to the Texaco Red Star with the Green T for superior fuels and safer, more dependable lubricants.

TEXACO

THE TEXAS COMPANY

Refiners of a complete line of Texaco Petroleum Products, including Gasoline, Motor Oil, Industrial Lubricants, Railroad and Marine Lubricants, Farm Lubricants, Road Asphalts and Asphalt Roofing.

PLEASURE

is always
on your side
when you smoke

Camels

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